COMMODORE

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OCTOBER 1985

SPECIAL DISK FEATURE!

How they'll work for you...
Which floppies...
Turbo loaders...
Disk based games

GRAPHICS

The great new packages

Exclusive
The brand new MUD

MEGA REVIEWS

Summer Games · HyperSports
and many, many more

also The new 64 Superscript
and the amazing
C Primer Plus

HINTS AND TIPS FOR THE 64, 128 AND PET

FREE! WITH THIS ISSUE COMMODORE BUSINESS MAGAZINE

COMMODORE BUSINESS MAGAZINE
The PC20-CBM'S Hard Disk Winner ON TEST
Where and how to buy . . . specialist databases . . . top packages . . . learning how to use it . . . maintenance and supply . . . PET to PC interface . . . Reviews – the sensational new 800: Pegasus and PSION

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The 128: The NEW 1571 Disk Drive:
FIVE 1541 DRIVES: Disk Games and Software:
MUD Pack: Loads of other prizes too!!!

AND ON THE EIGHTH

SUMMER

Experience the thrill of top international competition in your own home! Summer Games II brings it all to you with eight challenging new events. You and up to seven other contestants can compete in your favourite individual event or go for it all in the grand competition. Some events, like cycling, rowing and fencing even challenge you with realistic head-to-head competition.

First, decide which of the 18 different countries you're going to represent. Then, in true Olympic fashion, you will need the proper strategy and mental toughness, not just speed and agility to excel in each of the eight events. That's why we included a feature that lets you practice each event until you're ready for the real competition.

Remember, it's not too early to get ready for 1988. With the right diet, proper training and lots of practice you just might make it. In the meantime, put on your sweatsuit, grab that joystick and let Summer Games II give you eight new ways to **Go For The Gold!**

- **Includes Cycling, Fencing, Kayaking, Triple Jump, Rowing, High Jump, Javelin and Equestrian Events**
- **Opening, Closing and Awards Ceremony With National Anthems**
- **Compete Against The Computer or Your Friends**
- **Individual and Head-To-Head Competition**
- **One to Eight Players**

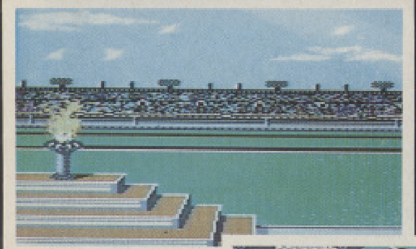
'SUMMER GAMES II DOESN'T LOOK SET TO BECOME A CLASSIC– IT IS A CLASSIC!'

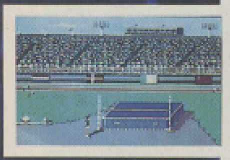
–ZZAP 64

ZZAP 64
PRESENTATION ..99%
GRAPHICS 97%
SOUND 96%
HOOKABILITY ...98%
LASTABILITY ...97%
VALUE 98%
OVERALL 97%

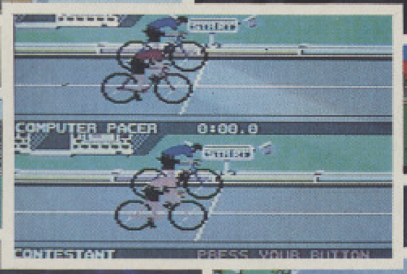
DAY EPYX CREATED…

GAMES II





▲Opening Ceremony
▼High Jump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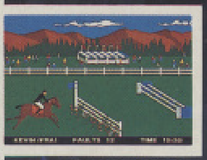
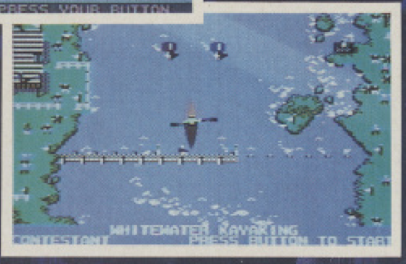
CONTESTANT PRESS YOUR BUTTON

Cycling ▶



Equestrian ▲
Kayaking ▼


WHITEWATER KAYAKING
CONTESTANT PRESS BUTTON TO START

'Summer Games II now takes the Gold as the greatest sports simulation ever created for the 64.'
—Commodore User

'Summer Games II is eight outstanding games rolled into one piece of software—100% value for money.''
—Computer Gamer

Screen shots as seen on the Commodore 64

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DISK £14.95

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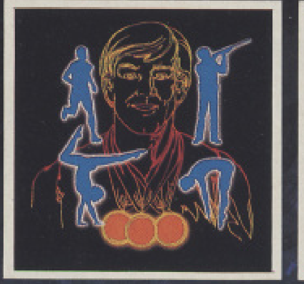
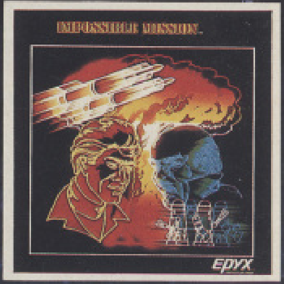
SUMMER GAMES



IMPOSSIBLE MISSION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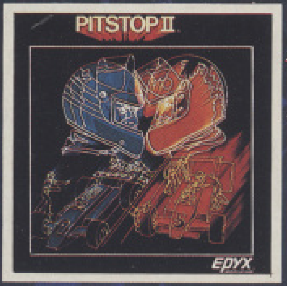
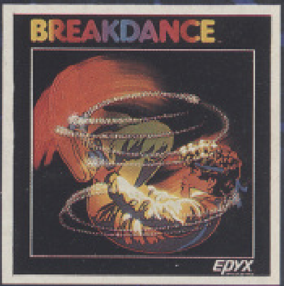
EPYX


PITSTOP II
EPYX

PITSTOP II


BREAKDANCE
EPYX

BREAKDANCE

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Centre, Heneage Street, Birmingham.
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Telex 337268

U.S. GOLD All American Software

EPYX™ COMPUTER SOFTWARE

The one magazine every Commodore owner needs

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October 1985

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Opinion...

Dear Reader

"There are 15,280 millionaires in . . . . it has proved that Britain can keep up with the rest of the world when it comes to . . . . the best sports simulation ever to hit the 64 . . . . is Silicon dead? . . . you'll never use another language again . . . ." Just a few of the lively, provocative, informed comments you will read in this issue of CCI. There is also a lot more besides to entertain and keep you up-to-the minute with all you want to know about the world of Commodore.

For the games buffs, there are mega-reviews: you'll find very special disk features and we have a 36-page business supplement. And don't forget, there is £5000 worth of terrific prizes to be won in fun competitions.

As usual, CCI is not only providing you with unrivalled breadth and depth of coverage, but also giving outstanding value to anyone who is interested in Commodore's world.

By the way, a little advance notice. Watch CCI for the coming months for even more exciting new developments. I think you'll agree, you'll find the best of Commodore in the best of the Commodore magazines.

Yours sincerely,

Antony H Jacobson,
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Got a PET, getting a PC, no problem, 3D allows you to connect the two.

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US GOLD IF SPREAD/63
Take your 64 to its limits with Summer Games II from US Gold – Beach-head I sold over 100,000 copies will Beach-head II repeat this.

VIZA SOFTWARE 36 (OBC)
Vizawrite PC – wordprocessing package for the Commodore PC, intuitive simple and fast.

...news ...news

Commodore US to post fiscal 4th-quarter loss of $80 million.

In mid-August Commodore International said in New York that it will report an $80 million loss after tax. This includes a $50 million inventory write down.

This was due in main to the large drop in sales of their flagship, the 64, and the delay in delivery of the 128. Although the 128 is now being shipped, the computer on which Commodore are resting their future, the Amiga, is not expected to start being shipped until September. This will make Commodore's statement that it will be profitable by Christmas seem unlikely.

A Commodore spokesman said of the loss:

"I can only comment on the UK impact of this, but as far as that is concerned, Commodore went for market stability instead of immediate sales. In doing this they intend to avoid the problems that Sinclair and Acorn got in to."

And continued: "Had the price war continued spiralling, it would have led to greater problems in the long run".

Dixons announce decision not to take 128.

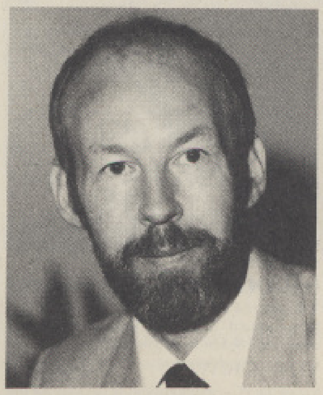
Dixons, the high street electronics chain, recently announced that they would not be stocking any of Commodore's new 128 computers. Instead they are solely taking Sinclair's QL in an attempt to push it into the forefront of a market where it has previously had difficulty.

Dixons feel that they should only sell one 128k machine and they have chosen the QL.

A Commodore spokesman said of this decision

"I don't believe this decision will adversely affect sales of the 128. There are many retail outlets showing great interest in stocking the 128 and we are not worried that Dixons have chosen not to take it."

Commodore announce new Marketing Manager.



In the seemingly never ending saga of staff at Commodore they have announced a new Marketing Manager. Mr Chris Kaday, formerly with Kalamazoo Business Systems.

Kaday has had considerable previous marketing experience in micros and hopes to:

"pave the way for the launch of a range of innovative products".

All at CCI wish him the best of luck in his new position.

Commodore Comments...

This month's Commodore Comment comes to you from Paul Welch, Manager, Marketing and Consumer Sales.

The opinions published here are those of Commodore, and do not necessarily concur with the views of CCI.

"We are entering an exciting era in terms of new products. We had a very successful launch of 128 that will be appearing in the stores in September. The consumer should check high street outlets during that month.

The current micro holiday package is selling exceptionally well and we are extending the offer until 30 September to facilitate all those people who are currently on annual vacation.

Anybody who buys a Commodore home computer between now and 30 September qualifies for three nights free accommodation for two people. On top of that there's the opportunity to win one of 100 computer weekends for two people to teach them how to get the best of your home computer.

Another offer currently running is a free Compunet modem when you buy a 1541 disk drive.

There's also a great opportunity to purchase a peripherals package of 1541/MPS801/Arcade Extravaganza/EasyScript – all for £349.99, a saving of £150.

A lot of end users are requesting C16/Plus 4 software. Currently Commodore are offering 83 titles which can be purchased through our C-Soft department here at Corby. We will obviously be further developing software for those new machines and C-Soft can inform you when new titles are available.

We are shortly announcing a new Commodore Club of which more details will be issued shortly. This will be designed to keep all club members fully informed of hardware and software, feature competitions, and give special offers to members. It is planned to have this established before Christmas.

There is obviously a lot going on at the moment re-inforcing Commodore's position as the number one home computer company."

CLUE: How many dwarves feature in Snow White and the Seven Dwarves?

Spinning a Tale

Speed and reliability are just two advantages disks hold over their tape counterparts. Pat Richards describes how disk are manufactured and how they work.

Most home-users make do with using cassette recordings for data storage. However these were never really designed to work with computers, their only advantage being price.

If you really want to make full use of a microprocessor you need a fast and reliable way to handle data storage. Disk drives were designed for computers, offering features such as large capacity, ease of use, reliability and fast access to the tune of a fraction of a second as opposed to minutes.

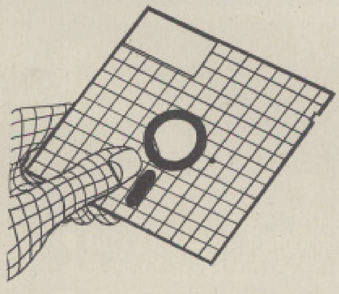
The same principle of magnetic recording to store data used by cassette recorders applies to disk drives. But whereas a tape takes a long time to wind through, part of a disk can be found quickly. A disk is also the most suitable shape as it has a fairly large surface area to store lots of data.

So what exactly is a disk?

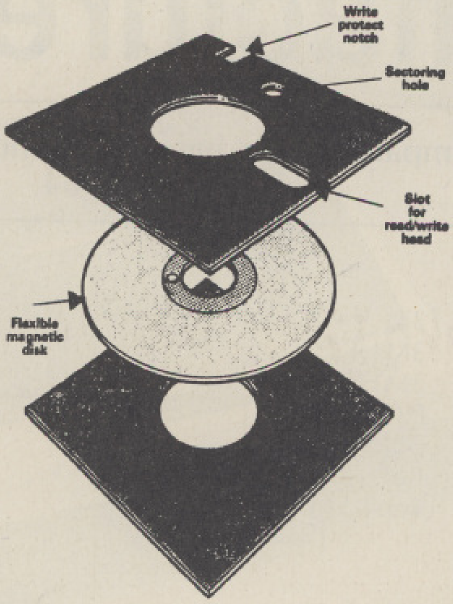
Well, a disk starts life as a 26 inch wide, six mile long roll of polyester film. This film is coated with precisely formulated computer grade magnetic oxide to a uniform thickness, measured in micro-inches, on both sides.

Circles of 3.5, 5.25 and 8 inch diameter are then punched – 5.25 being the size of disk relevant to users of home computers such as the 64 or 128. At the same time, the centre drive spindle (to enable the disk drive to hold the disk in place), index and vector holes are also punched.

Once punched the disks are placed into semi-automatic machines which polish both sides of the disk using a silica-treated film. Known as burnishing, this process creates a fine, smooth finish enhancing electrical performanc and improving the reading and writing of data. The smoother the surface, the more protection there is against surface friction nd ultimate head wear.



CLUE: How long did the 100 years war go on for?



The next stage, which also adds to performance, is the fitting of a protective jacket.

Positioning of the index hole on a disk is also important. This hole allows a beam of light in the disk drive to check the correct position of the disk and head slot holes, where the disk is exposed to read/write heads.

Shape and positioning of the individual holes varies according the type of disk. The addition of stress relief notches help to prevent distortion of the head slot. Write protect notches are also added to prevent data being inadvertently erased.

The final stage is the insertion of the burnished disk into a jacket. The end flap is then sealed enclosing the disk completely. And there you have your disk.

But how does a disk work?

When a disk is inserted in a disk drive, it is gripped by a pair of rings which clamp its centre. These rings are driven by an electric motor to spin the disk.

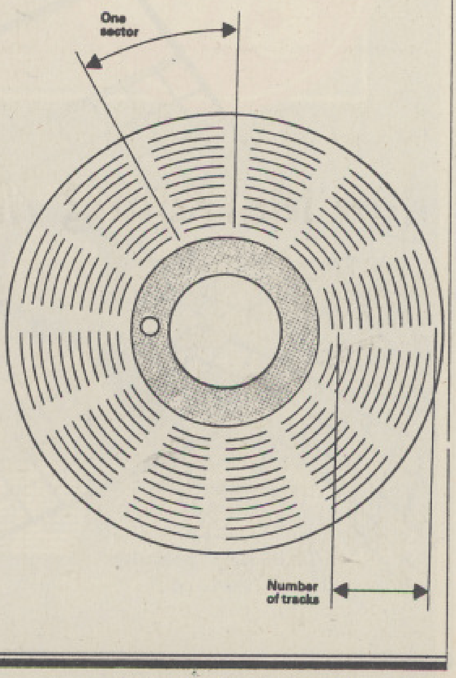
The disk drive spins the disk at around 300 revolutions a minute. A read/write head moves in and out from the centre of the disk to its edge. It moves quickly enabling any part of the disk to be brought under the read/write head in a fraction of a second.

Unlike the original 8 inch disks which spin continuously when the disk is in the drive, the cheaper 5.25 inch disk spin only when data is being read or written, reducing wear. This makes then a little slower as the computer has to wait for a second or two for the disk to start spinning.

All disks cram large amounts of data onto their surface. This in the form of ones and zeros represented by tiny points magnetised on one direction or other.

In order to be able to find any item, data has to be organised carefully. Data is stored in a number of concentric rings, known as tracks. Each track is a bit like a short length of audio tape bent into a circle. Most 5.25 inch disks have 40 or 80 of these tracks.

Disks are also divided into sectors – segments which divide the disk up, the edges of each sector being a radius of the disk. Running at right angles to the tracks, sectors split the disk into a large number of



small blocks of data. Each block holds only a few hundred bytes of data.

A block of data is found by the read/write head moving in or out of the appropriate track. The head then waits for the spinning of the disk to bring the block to the head.

In order to find a block of data, the drive has to be able to tell where each sector starts. Previously this was done by having a hole through the disk to mark the start of each sector. Known as hard-sectoring, this produced a ring of small holes near the centre of the disk.

Soft-sectoring is now used whereby there is only one hole through the disk and the sectoring information is recorded on the disk's magnetic surface in the same way as ordinary data.

This method allows the number of sectors to altered. Different makes of computers use different numbers of sectors. Soft-sectoring allows disk manufacturers to produce one brand of disk suitable for many computers.

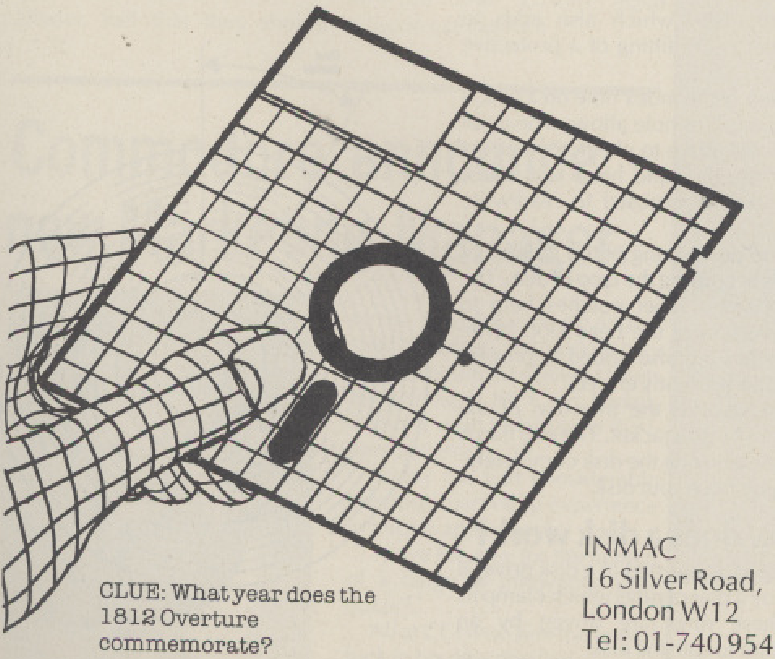
Finally, a word of caution

Disks may well be referred to as floppies, but it is inadvisable to bend them! Due care and attention should be given to looking after disks. When not in use, keep them in their protective sleeve jackets. Don't leave then lying around gathering dust and scratches. It can not only damage your disk, but think of all your valuable work you stand to loose!

List of Disk Manufacturers

The companies listed below all manufacture disks suitable for the 64.

MEMOREX
Memorex UK Ltd,
Memorex House,
96-104 Church Street,
Staines,
Middx.
Tel: 0784 51488



CLUE: What year does the 1812 Overture commemorate?

3M
3M UK PLC,
3M House
P.O. Box 1,
Bracknell,
Berks RG12 1JU
Tel: 0344 426 726

INMAC
16 Silver Road,
London W12
Tel: 01-740 9540

XIDEX
Centech Ltd,
The Argent Centre,
60 Fredrick St.,
Birmingham 1 3HS
Tel: 021 223 4041

ELEPHANT
Dennison Manufacturing Ltd,
Colonial Way,
Watford WD2 4JY.
Tel: 0923 41244

BASF
4 Fitzroy Square
London WIP 6ER
Tel: 01-388 4200

GOLDSTAR
South Bank Technopark Ltd,
90 London Road,
London SE1 6LN
Tel: 01-388 2900

PARROT
C.P.S,
Arden House,
1102 Warwick Rd.,
Acocks Green,
Birmingham B27 6BH.
Tel: 021 707 3866

At last, the big performance graphics printer with the low price

Designed for the Commodore 64 and the Vic 20
commodore 64
SEIKOSHA
GP-100VC
Seikosha
GP-100VC
from around
£115
+ VAT

The Seikosha GP-100VC with its unique combination of high performance and low cost is designed to put the quality graphics printer within easy reach of the home user.

Built extensively for the VIC Personal Computer, its elegant styling and wide range of features make the Seikosha GP-100VC a graphics printer you simply can't afford to miss.

The Seikosha GP-100VC features:

- Total VIC PC compatibility
- 80 column dot matrix impact format
- A print speed of 50 cps
- All VIC-20 characters, symbols and graphics as standard
- Compact design, ideal for home use
- Inverse character printing
- Printing of graphics image can be repeated
- Accepts paper 4½" to 10" wide
- Tractor feed

The Seikosha GP-100VC is available at your local computer dealer.

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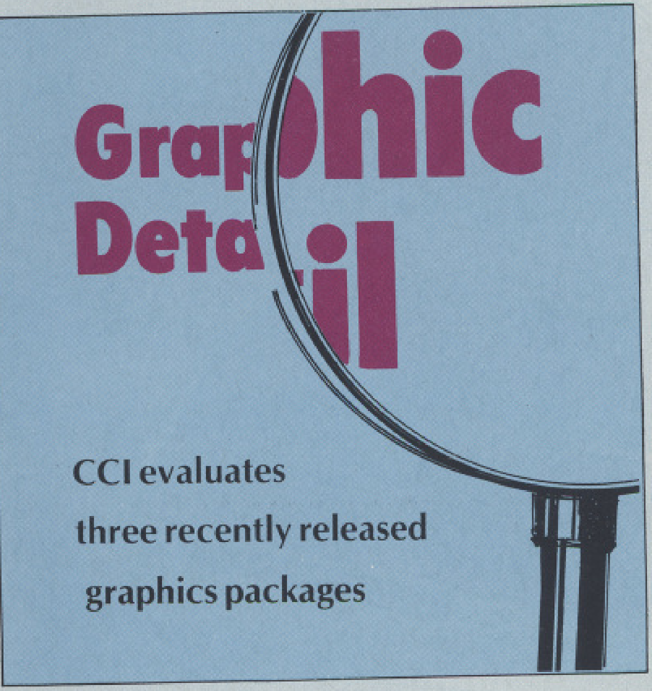

CCI evaluates three recently released graphics packages

Datex Graphics Mouse System

Of the four graphics utilities reviewed here, the graphics mouse was far the most enjoyable to use.

For £75.95 you get a mouse which plugs into joystick port two, and software available on disk or cassette.

The mouse is beige in colour with two buttons at the front – select and release. It requires a smooth surface and is comfortable to the grip.

However, it is the software that we are really concerned with in this instance. The screen shows the various options from the obvious draw, paint, fill and erase to text, brush styles and a choice of spray and fill patterns, the latter of which can be modified by the user.

There are also four pull-down menus – options, extras, line and text.

Fifteen colours are available for both the background (paper) and foreground (ink). However, due to the Commodore graphics system it is only possible to have two colours on the screen at one time. Despite this, it is possible to create some striking pictures.

The quality of circles and diagonal lines is good. Also the speed with which shapes are drawn and filled is acceptably fast unlike some of the other packages reviewed here.

While being initially fun to use, the erase function in the graphical form of a rubber requires concentration and a steady hand. One of my only gripes with this program is the lack of an 'erase last move' feature. I couldn't get perfect results using the erase and on more than one occasion virtually tore my hair out after, for example, leaving a small gap allowing colour to flood in where it shouldn't have been. There is an 'erase all' function, but this is not suitable in the above instances.

Being icon-driven, the program is extremely easy to use. It's facilities make it attractive to not only the budding computer artist, but also to the small businessman who may well find it useful in terms of producing graphs and pie-charts. Indeed further utility and word processing programs are being developed for the more serious user.

Contact: EEC Distribution Services, 14 Western Parade, Barnet, Herts EN5 1AD. Tel: 01-441 1722/1590.

Activity Centre

Described as a creative toolkit, Activity Centre contains the facilities to write, draw, animate and compose. We are concerned with the graphics element only here, but bear in mind these other features when comparing the price of £14.95 to the other products on this page.

On loading, the main menu appears on the screen. Here you select the colours you wish to use by means of the function and cursor keys. Four colours can be used at any one time: the background colour and three line colours.

Selecting the draw/page feature clears the screen and puts up a pop-up menu with drawing and writing options – menu, text, draw, circle, boxes, line, fill and copy.

The speed with which you draw is excrutiatingly slow. Four speeds are offered, but making the arrow draw faster gives a dotted line: the faster you move, the wider the gap between dots. This is all very well, but trying to fill a shape you have just drawn with a doted line does not give the required result, as you can well imagine!

Specified shapes such as circles and boxes are drawn by positioning two arrows at the required edges and pressing fire or the Commodore key.

These shapes are drawn reasonably accurately and a useful feature is that the arrow jumps back to the first point set, allowing you to produce concentric circles or a series of boxes with a common corner.

CLUE: How much memory does a Commodore 64 have?

The speed of drawing with a solid line, circling, drawing boxes and filling is painfully slow. I also found that the necessity to switch between the cursor-function keys to select options and the joystick draw meant that for the first time I found myself using the keyboard in preference to the joystick in drawing.

Purely from the graphics point of view, I could not recommend this package, but if you are looking to animate and produce a musical background to your artistry, then Activity Centre is worth considering.

Contact: Argus Press Software, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666.

Doodle

Doodle is designed to work not only with a joystick, but also a trackball which allows much better control while drawing.

The first thing that strikes you when you load this program is the colourful loading screen – simple but very eye-catching. Unfortunately this was one of the things I liked the most about this program.

Ten modes are offered: sketch, lines, boxes, circles, colour, zoom, copy, stamp (similar to copy), letter, disk and print. More information on each mode is offered, once that mode is selected, by pressing shift/return – quite a useful feature here.

As with Activity Centre, the initial drawing speed is SLOW. However, you are given the option of nine speeds. I found that 4 or 5 gave the most acceptable speed while still maintaining a fair degree of accuracy. At speed 9, you have very little control, but you can certainly doodle.

Circles and boxes are fine when drawn, but attempting to fill around them results in some very ragged edges.

Useful fetures include the ability to change dot size, a grid facility, mirror, memorize, recall and negative (produces negative image of illustration).

Your Doodles can, of course, be saved to disk (a directory facilitiy is included). Doodle comes set up for the 1525 printer but can be used with the printers listed under the 'change printer' option.

Contact: Quicksilva, Argus Press Software, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666.

You've never seen anything like it.

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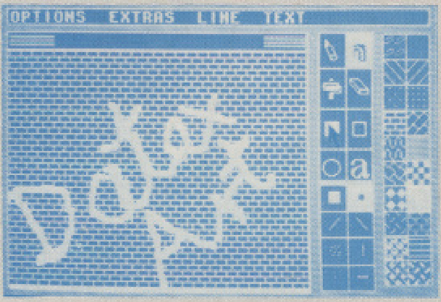

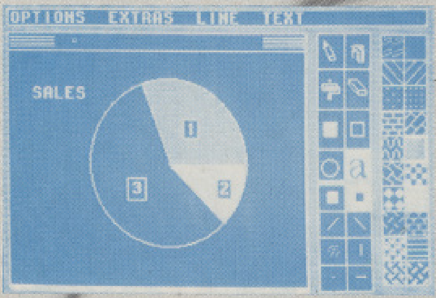

We've given the Mouse a wide variety of brush and spray shapes, different screen textures and a whole palette of pre-programmed background patterns.

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Drawing a circle, for example, is a simple matter of marking the centre, moving the mouse outwards until you've found the correct size and then pressing the 'select' button to plot the circle.

Put all that together and you've a stunning graphics package – at the touch of a finger.

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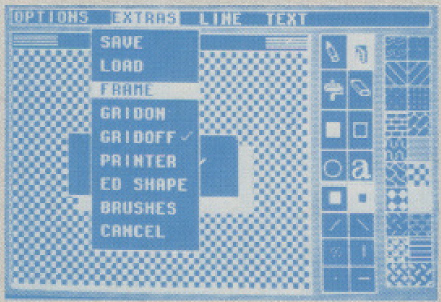

Datex Mouse. There's nothing in the world to touch it.

DATEX

Optical MOUSE MS-1

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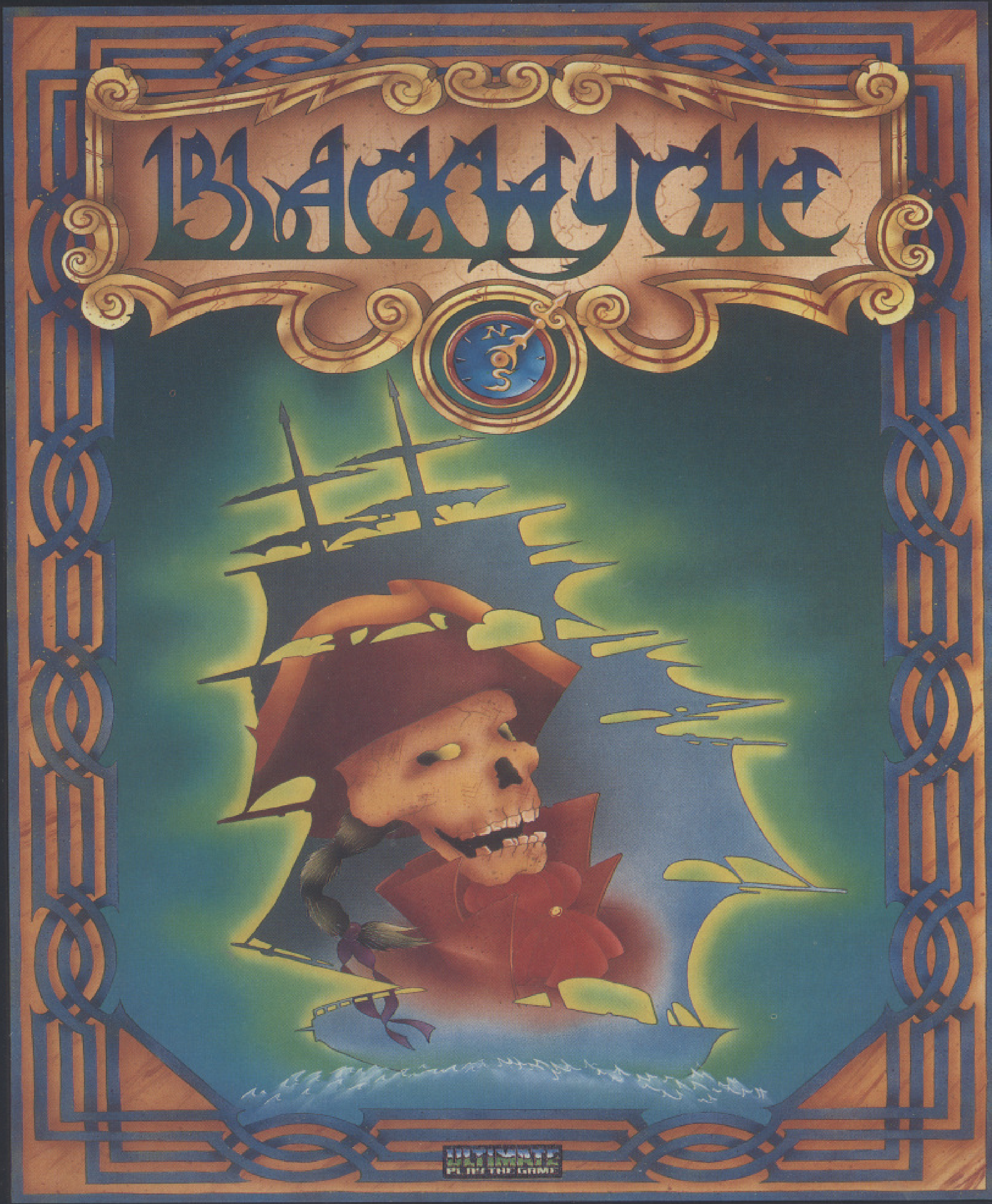
COMMODORE 64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COMPARATIVELY FAST

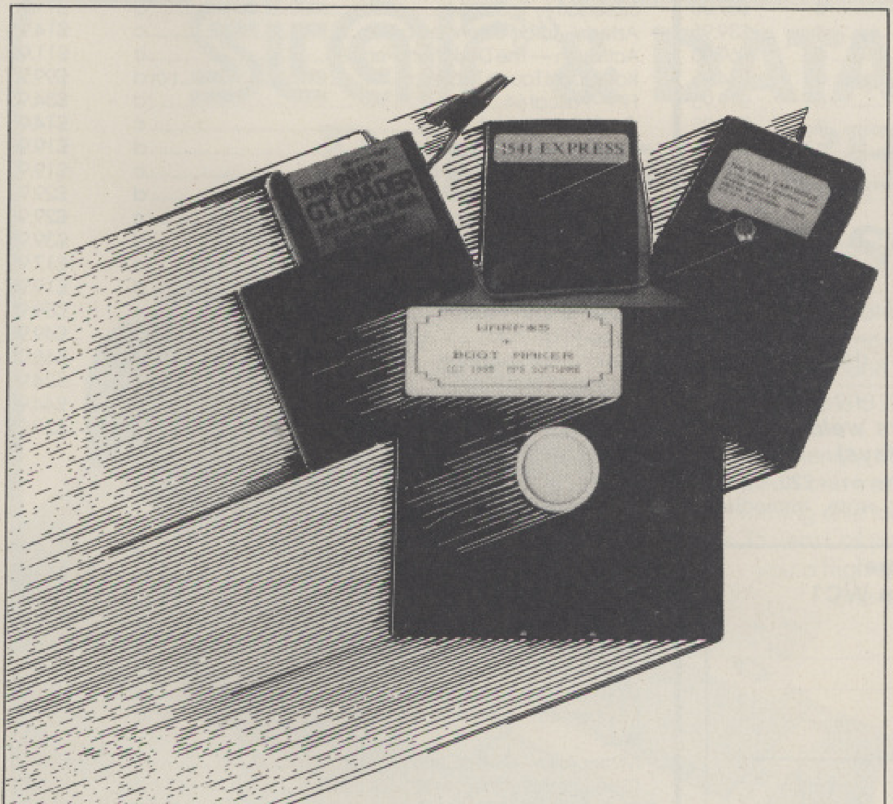
Commodore's 1541 disk drive is notoriously slow. Francis Jago compares a selection of products designed to speed up the 1541.

It was about a year ago when 'it' first happened. I was utterly amazed, it couldn't be! Unfortunately since then it has happened on a pretty regular basis. I can hear you asking what is this nutty journalist going on about? So I'll elaborate . . . Turbo loading cassettes loading faster than my serially interfaced 1541 disk drive!

With this sorry state of affairs becoming more and more common, this review is concerned with comparatively testing all the cartridges and disks we could get our hands on to speed up the 1541.

Of the six products reviewed here, five are cartridge-based and two of those require you to connect a flying lead inside your 64. Although this could possibly invalidate your guarantee it is really very easy, and anyway most of you will have had your 64 for more than a year.

Although most of these products contain toolkits of some sort or another I will not be going into great detail on this front. Basically I will be summarising the speed increases I noted and my general impressions of compatability and overall value for money. If, however, one is very expensive but has many worthy facilities I will say so.



WARP★5

The first product is WARP★5 by MPS software, available only on disk. To load you simply load it normally, the screen then clears and reappears with a colourful new display with a MPS copyright statement at the top and 'Warp 5 installed' message where the Commodore message usually is.

Warp 5 worked well with most programs and comes with a built in Bootmaker which enables you to load programs which it would otherwise not be able to cope with. Even so I could not get it to load Summer Games II or Beach Head II. Warp 5 is also a little impractical as the time taken to load the program itself, although small, is noticable enough to make a difference.

GT LOADER

Trilogic's GT. Loader was the next I reviewed. Although it requires the fitting of one flying lead, the manual is comprehensive and I see no difficulty for anybody in attempting to fit it. Once fitted it performed remarkable well, doing all it promised to do. It seemed reliable and unlike two of the others, it worked first time.

1541 EXPRESS

Ram Electronic's 1541 Express also required the fitting of flyers, two this time, but again they were very simply put in place. As my table shows it was in fact the slowest of the cartridges reviewed, but it also was reliable. To be honest, the 1541 express had nothing that the others don't and overall was slower by quite a margin.

EPYX SPEED LOADER

The Epyx speed loader was relatively quick and loaded everything that I tried on it. It, like four of the others, uses an easy combination of keys to initiate the speed loading process (the Commodore and Run Stop keys in this case) and was indeed quicker than normal, but when it comes to splitting hairs, as I must, this perhaps surprisingly did not come out top.

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software pricelist — prices include VAT
d = disk c = cassette r = cartridge

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Adamsoft — Graphics Designer	d	£19.95
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Handic — Mon 64	r	£34.95
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ROBCOM 5

The next problem I encountered was with the ROBCOM 5 cartridge. In my tests it was one of the fastest, but when attempting to load commercial programs I experienced a few difficulties, especially with games. When it did load programs it was both fast and reliable but unless you specifically want a loader for loading and saving long data files or business programs, or you want to use the extensive and very good toolkit features I would not recommend this specifically above any other.

QUICKDISC +

Evesham micros Quickdisc + justifies its reknown as it is fast, easy to use, and as with the Robcom has a useful reset button. It was one of only two loaders, Trilogics being the other, which I did not see fail.

FINAL CARTRIDGE

Aptly named for this review is the Final Cartridge. Produced by Home and Personal Computers in Rotterdam, Holland, it was the fastest of all the products reviewed and loaded over 90% of the programs I tested on it. The Final Cartridge has so many other features that it is really a little unfair to compare it here, and indeed in next month's issue we will have an in-depth review explaining more about it. Suffice to say that it was this one that earned a permanent place in the back of my 64.

Although my table shows the actual results of time tests, I would not like to have to put these in order of preference as it really does depend on what you use your computer to do. If you are a games player then Quickdisk or Warp★5 are sufficient. If you are a business user then consider 1541 Express. If you dabble in Basic then either the Epyx or Trilogics GT. Loader would prove invaluable, but for the serious machine code user the ROBCOM 5 or Final Cartridge are tops.

Timing table

Product	Time to load 26k program in seconds	Would it load Summer Games?	Increase over normal
Normal 64	69	Yes	
Epyx	21	Yes	3.2X
1541 Express	34	Yes	2.02X
Warp ★ 5	15	No	4.6X
Trilogic	18	Yes	3.8X
Quick-disc+	19	Yes	3.6X
ROBCOM 5	14	No	4.9X
Final Cart.	13.5	Yes	5.1X

CONTACTS

Epyx Fastloader: Contact US Gold, 10, Parkway Industrial Estate, Heneage Street, Birmingham, B7 4LY. Tel: 021-359 3020.

Trilogic GT. Loader: Contact Trilogic, 29, Holme Lane, Bradford, BD4 0QA. Tel: 0274-685926.

MPS Warp★5: Contact MPS, 36, Alexandra Grove, London N4 2LF. Tel: 01-800 3592.

1541 Express: Contact Ram Electronics, 106 Fleet Road, Fleet, Hampshire, GU13 8PA. Tel: 02514-5858.

Quickdisc+: Contact Evesham Micro Centre, Walltone Ltd, Crown Courtyard, Bridge Street, Evesham, Worcestershire. Tel: 0386 49641.

ROBCOM 5: Contact Robcom, 36, Market Place, London NW11. Tel: 01-209 0118.

The Final Cartridge: Contact Home and Personal Computers, 3083, MT Rotterdam, Holland. Tel: 010-311 0861 870.

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The End Of The Silicon Chip?

A man-made material has been found to have several advantages over Silicon. Anthony Mael looks to its future.

Are the days of the silicon chip numbered? No, not the chip itself, but the silicon from which it is made. It seems that, from recent developments, silicon's monopoly over chips is under threat from a material of which most people will not even know exists – gallium arsenide.

Gallium arsenide (GaAs) – made by fusing gallium and arsenic in a sealed flask at very high temperatures and not a combination ever created in nature – has some extraordinary qualities that give it great advantages over silicon, from which virtually all chips are presently made.

Firstly, the speed at which electrons move within gallium arsenide's crystallate structure allows electrons to travel, at least in theory, five times the speed of silicon. That makes gallium arsenide exceptionally suitable for the superfast computers now being developed.

Recently Honeywell Physical Sciences Center in Minnesota, USA, announced that they had developed a simple device using gallium arsenide that allowed electrons to move from the input to the output of the device at 11 trillionths of a second at room temperature.

The second great advantage of the new material is the resistance of gallium arsenide circuits to heat. Silicon chips deteriorate with heating; gallium arsenide devices work without difficulty at 200 degrees Centigrade – 75 degrees above the maximum of silicon.

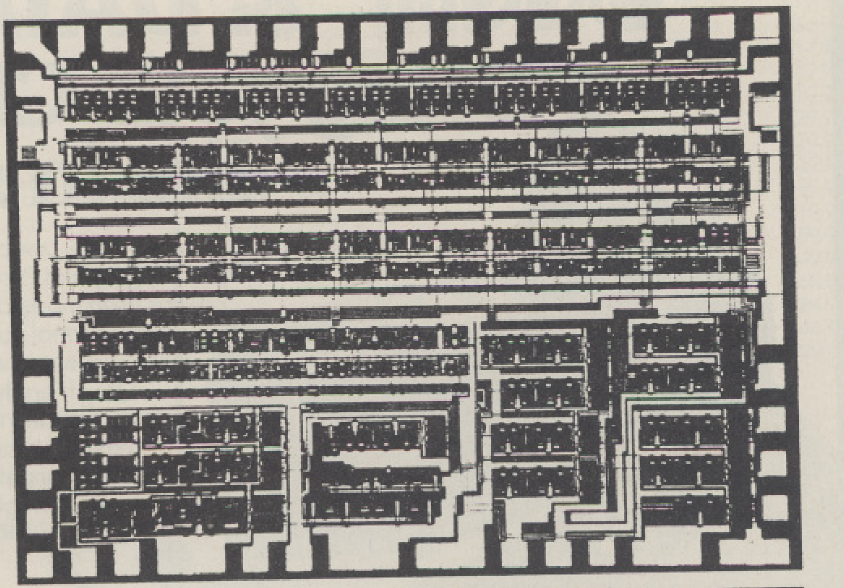
The new material also has other advantages over silicon. It is for example, unlike silicon, resistant to ionizing condition. The image of a total blackout of electronic communications after a nuclear strike terrifies military planners. In space and on the ground, gallium arsenide's resistance could prove of vital importance to the ionizing effects of radiation burns.

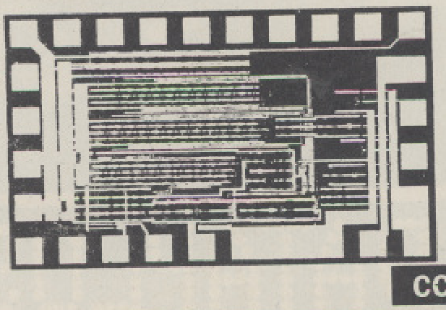
In addition, gallium arsenide devices use less power than their silicon equivalents. This factor is already interesting semi-conductor manufacturers whose aim is always to squeeze as much as possible onto their chips without generating too much heat or electrical disturbance. However, the big problem with gallium arsenide, at present, is the cost and difficulty of production. Although the production processes are virtually the same as for silicon, it is an extremely complicated task to produce gallium arsenide crystals or large enough size or high enough purity. Plessey claim to have created the first gallium arsenide circuit in the mid-1970's. But only in the past three years have they been able to manufacture the neccessary round slices with which to work.

In the last year two US companies – Microwave Semiconductors and Gigabit Logic have put small gallium arsenide circuits on to the market. And two contracts totalling $30 million have been awarded to Rockwell and Honeywell by the US Department of Defense to carry out pilot projects.

There are recent estimates that from nothing in 1984, sales of gallium arsenide chips could rise in 10 years to $14 billion worldwide. While these figures may be unduly optimistic, the big chip makers like Texas Instruments, Motorola, Vitesse and the Tektronix' subsidiary, Triquint are all showing interest.

Gallium arsenide chips are still at least 20 times as expensive as their silicon equivalents. However, with the advantages they possess, potential users will soon be found for them and that will push the price down in the same abrupt way as silicon chips costs plummeted.





HIGH-SPEED MULTIPLEXER CHIPS made of gallium arsenide are designed to operate at three billion bits per second. The multiplexers funnel digital signals received on eight parallel input lines onto a single serial output line. The two chips are identical in functional design but differ in implementation. The photograph above shows a chip built with the technology we call GaAs-I. It incorporates 230 gates, or fundamental logic circuits, which cover an area of two-by-three millimeters; power consumption is about four watts. The chip at the right, built with GaAs-II technology, fits the same 230 gates into one-fourth the space and dissipates only one-tenth as much power.

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What is Superscript? –

Superscript combines word processor, spelling checker, calculator and mailmerge facility, all in one package. So Superscript gives you all the tools you need to produce high quality reports, tables, lists, personalized letters and even labels quickly and efficiently. Superscript is a remodeled and vastly enhanced version of the popular **Easy Script** and **Easy Spell** programs that have sold more than 350,000 copies worldwide, so you ***know*** you can rely on it.

Simple for the beginner

If you are a newcomer to word processing, Superscript's simple command menus put you immediately at ease.

Each command is a single word, and for each command there's an extra line of helpful description. To select a command, you simply move the cursor. You don't even have to type the command!

Once you are more familiar with Superscript, you can bypass the menus.

Powerful for the experienced user

Superscript also gives you the ability to *cut work down to a minimum* by storing your own command sequences or text on single keys. This means that with a single keystroke you can reproduce commonly used phrases or multi-line addresses from a glossary, load in document formats or execute a pre-programmed sequence of operations. *That's intelligence!*

Editing options

Superscript gives you all the editing options of a business-style word processor, with full block manipulation for cut-and-paste; overtype or text insertion modes; search and replace with pattern matching and optional case discrimination; backward search; case shifts for single words or larger blocks of text. *And much more.*

Good with numbers

Superscript allows you to extend your editing line up to 240 columns for wide documents like financial statements, and with decimal tabs it's easy to enter properly justified tables of numbers.

Superscript's complete set of calculator functions can be used interactively, or you can operate on numbers from the text of your document. Apart from the usual mathematical functions like add, subtract, multiply, divide, and percentages, you have the ability to add rows, columns or even whole tables.

Good with spelling, too

The built-in spelling checker goes right through your text, checking the unique words against its dictionaries, and stopping at each one it does not recognize. You have the option to correct the error, learn the new word or ignore it. Superscript has its own 30,000 word dictionary. In addition, it stores new words as it learns them.

Mailings with Superscript

Personalized mailings are easy with Superscript. You can enter the data manually or use data extracted from your spreadsheet or database. Merging can be selective with equal-to/not-equal-to logic. A mailing labels template is included to help you complete your mailing and you can alter the template to suit your own label format.

Attention Easy Script users!

If you're an Easy Script user, then Superscript is the obvious choice. With its enhanced features and more powerful facilities, you'll be able to do so much more. There are no compatibility problems either. You can run your Easy Script data or Easy Spell dictionary disks under Superscript.

LOADS
INTO
MEMORY
TOGETHER

Superbase

The Programmable Database

For sheer quality and professionalism, Superbase is in a class of its own.

Easy to get started –

The first thing you'll notice about Superbase is the superb 230 page owner's manual.

The tutorial section takes both first-time and experienced users right from first steps through accomplished programming, while the reference section is a model of completeness. You'll enjoy the manual's easy style, its plentiful illustrations and comprehensive index.

Easy to use –

You'll soon be ready to set up your own filing system - business information, professional data, records of all kinds. You design your record layout right on the screen, exactly as you wish it to look, with helpful on-screen explanations never more than a step away.

With the layout in place, you can then use Superbase's built-in commands to enter, change or delete individual records. Once you have built up a file of records, you can select, sort and output data exactly as you need it. To begin with, you'll be accessing Superbase commands through menus. The menus lead you step-by-step to the required action. Nothing could be simpler!

The hidden power –

As you become more familiar with Superbase, you'll want faster ways of accessing commands. One way is through the command line. Any sequence of menu options can also be typed directly onto the second line of the screen, known as the command line. *But this is just the beginning.*

The *real* power of Superbase is that you can string any number of these commands together to form complete programs. When writing programs, not only do you have access to the dozens of powerful Superbase commands: you can also use the complete set of ordinary BASIC language commands.

This capability turns a straightforward data management system into a true database of incredible power.

Developing complex applications for yourself becomes a realistic proposition, with your hardware configuration as the only limiting factor.

The integrated office –

Superscript and Superbase will actually load into the computer's memory together.

This means that you can switch between Superbase and Superscript at will passing information between the two and working on your filing system and documents without ever having to reload. *That's integration!*

Buy your copy today, and join the thousands of satisfied Superbase users worldwide. They've proved its power and flexibility, and realised its benefits:

- ★ Entire machine-language program is memory-resident: No need for swapping or reloading.
- ★ Built-in single drive back-up utility.
- ★ State-of-the-art indexing for fast retrieval: any record in less than 0.3 secs.
- ★ Fields may be added, and field specifications altered without the need to restructure the file.
- ★ Data types include calculated result for on-screen field recalculations, including full BASIC math functions.
- ★ Searches may be up to 127 fields deep, sorts up to 34 fields deep.
- ★ Report-writer generates fully formatted reports from responses to simple question-and-answer session.
- ★ Allows linking across separate files.
- ★ Includes free label printing program.
- ★ Supports all standard printer interfaces

Also available on Commodore 64, Atari 800XL, Atari 130XE, Apple //c and Apple //e.

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Suitable for all ages, Supertype guides the novice typist towards complete typing proficiency, using proven keyboard training techniques. All the family can learn to touch-type at home, acquiring a valuable skill.

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CC1

Play Dirty wi

With the forthcoming launch of British Telecom's stand alone version of MUD Francis Jago explores this world of dungeons and dragons.

When a modem is first purchased, most people already have an idea of what they will use it for, whether it be to access Prestel, Bulletin boards, Electronic Mail or to send programs from one friend to another. All these and many more are useful and relatively easy to set up using a modem and your Commodore.

Unfortunately all of these practices are usually associated with serious use, and even the newer and more light hearted Bulletin boards or Prestel's 'Micronet' do not fully exploit the endless possibilities of having a real time, multi-sectored and multi-user game.

This is surprising as for many years now certain universities (notably Essex) have had a extensive version of perhaps the most famous multi user game ever — MUD — up and running on their university computer (a DEC-10). Unfortunately due to the constraints of time and resources MUD only opens its gates from 1am to 7am making it impractical to any normal person!!

To understand MUD's cult following you must first have either played it or talked to an avid MUDDER. Generally there are only avid MUDDERS as you have to be very dedicated to say the least to stay up all night to play a derivative of Dungeons and Dragons!!

"A cult following"

Now that British Telecom are releasing a totally Public access MUD I would be very surprised if more and more Modem owners did not use their Modems for a more frivolous and fun pastime.

The new version of MUD differs from the Compunet and Essex versions as it has been converted to a VAX 750 which will allow for a much more advanced version to finally be released.

When you enter MUD you are basically entering a different world; this may sound like the PR from the new Asimov book but

The Commodore Kid
by Max
M.U.D
STARTER KITS: MUD PACKS ...
GREAT! I'LL HAVE ONE OF THOSE !!!
SPECIAL DELIVERY!!
THANKS!
IDEA!
MUD PACK

ith M.U.D

in fact it's the only way to describe it. You must choose a character name, and what race you wish him to be. Having sorted out your man you must then explore the vast amount of rooms collecting treasures and doing battle with various evil villains.

What makes the game really different is that (as it's name suggests!) many other people are exploring as well as you, and you are free to converse, fight, joke or argue with these people. This becomes very interesting as you can make both good friends and hated enemies all through the reliability and personality of your character.

"MUD is escapism"

MUD is best described as escapism. You are free to become all the things which are impossible in real life, with the ultimate punishment being death — only in MUD you can return!

At the beginning of your quest you are ranked as a 'novice', meaning that you are a beginner with little experience. Gradually, however, you can work your way up through the many ranks, such as Champion, until one day when you will become a Wizard. Being a Wizard in MUD is one of the ultimate accolades, as well as personal pride you gain many extra commands and actions.

One of the best commands for a Wizard is the 'snoop' command. This allows you to overlook a Mortal without them knowing it. As a Wiz you can also animate lifeless objects. This may sound confusing, but it explains the difficulties of fighting a tree!

"A stand alone version

The British Telecom MUD (sometimes refered to as MUD II) is a real improvement from the original MUD. Although still closely based on the original version of MUD, the Telecom version is the first totally stand alone one and from the press information I have received and the interview with Mike Anderiesz, the Project Manager of MUD, it seems to me as if it should be absolutely superb. It features three times as many locations and many more spells and commands.

As Mike Anderiesz said when asked about the future of MUD: "MUD will lead the way. In future it won't just be software support that determines the success of a micro, it will be the price of modems and the quality of on-line games too.

With more titles like MUD already in the pipeline, and the tremendous interest we've received from users of most popular computers in all age groups, we're confident we're on to a winner."

To play MUD, apart from a modem and some dumb terminal software, you will need to buy (or win in our competition) a MUD pack (I'll skip all the obvious jokes). This entitles you to an access code and a personal password as well as 30 credits — equivalent to three hours play — as well as other bits and pieces. At £20 the MUD pack is not too expensive. Credits cost 20p each and are bought in batches of 50. MUD packs will be available after the PCW show, by mail order only.

Commodore Computing International's raving MUD reporter will be making a monthly update on the progress of MUD from its launch on stand 1011 at the PCW show to The First MUD Spectacular on November 5th and hopefully after that too. If you have any comments on the game or any suggestions as to what the column should consist of, sent them to Francis Jago, CCI, 40, Bowling Green Lane, London EC1R 0NE.

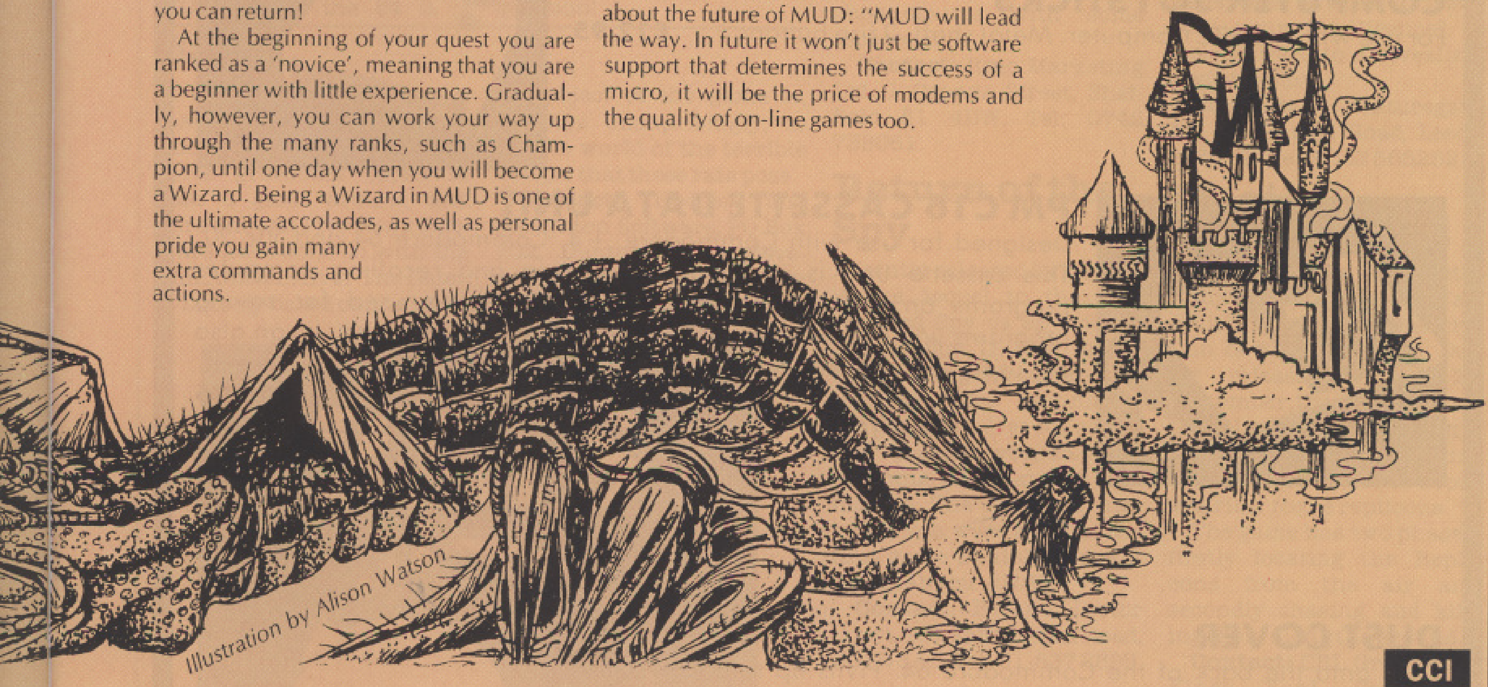
Illustration by Alison Watson

CCI

132 CHEMIS
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CHEMIST
FANTASTIC!
~~RELYON~~
MUD PACK
THIS ISN'T MUCH FUN!!
WELCOME TO M.U.D
OH YES IT IS!!!

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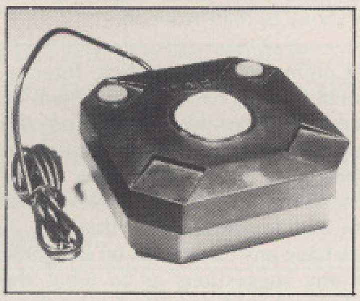
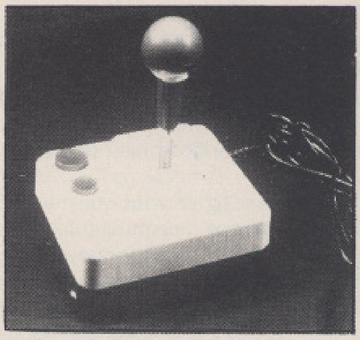
Tip Fire Button and side fire button fast action.



TRACKBALL

Improve your scores and skills with the Computek Trackball. Suitable for use with Commodore 64, Vic 20, Atari, Oric 1, Atmos and Spectrum use interface. **£17.95**



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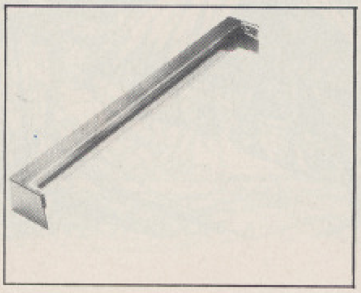
Designed for use with Commodore +4, Commodore 64 and Vic 20. This cassette unit is a device for storing and recalling computer programs on ordinary cassette tapes. It can be used for saving programs you have written and want to recall for later use. It can also be used to read pre-recorded programs that you have purchased. **£24.95**



DUST COVER

Clips onto the back of the Commodore 64. Pivits up to allow use of keyboard, fully moulded, clear plastic dust cover. **£7.95**

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Now Games!?!

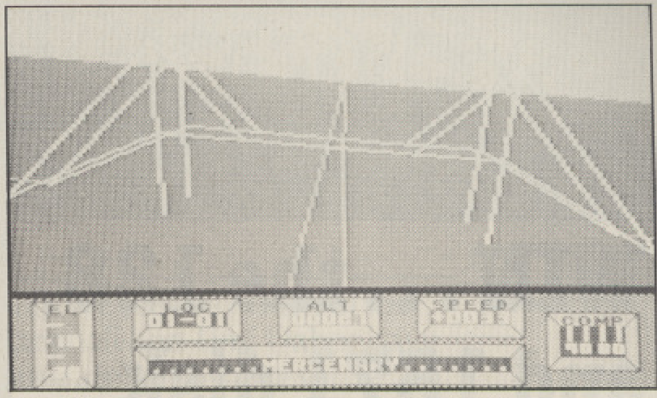
Virgin Games has recently announced a compilation tape organised by its managing director Nick Alexander. Consisting of six well known games including 'Lords of Midnight', 'Falcon Patrol II', and 'Brian Bloodaxe' to name but three. The tape will cost £8.95, making it a good buy for first time users.

Contact: Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX. Tel: 01-727 8070.

Mercenary

The newest and perhaps most hyped game to be released shortly is Mercenary by Novagen. Sub-titled "Escape from Targ" it utilises three dimensional vector line graphics, similar to Elite, to create a more realistic impression of flying.

Novagen promise that it will have many features of interest to all games players, whether they be arcade fans, die-hard adventurers or simulation freaks, and as the screen shot shows your flying abilities are tested to the full with challenges such as flying under bridges.



Priced at £9.95 on tape and £12.95 on disk Mercenary should be out shortly.

Contact: Novagen Software, 142, Alcester Road, Birmingham B13 8HS. Tel: 021-449 9516.

Hot Gossip

Perhaps the hottest gossip in the games world at the moment must be about Micro Powers shortly-to-be-announced game. Although no real details have been released, I can tell you that it will be similar to its BBC success 'Castle Quest', although on the 64 it is expected to be more than five times larger. Due to be released at the PCW show in early September, it is expected to be linked with a famous television character or series.

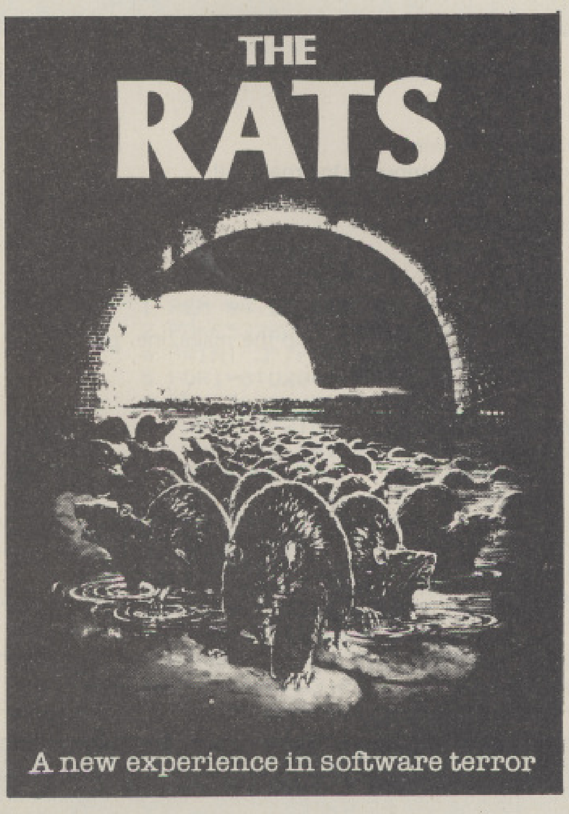
STOP PRESS: All is revealed ... Doctor Who is the man in question!

Rats!!

It must have only been a matter of time before someone used one of James Herberts gruesome books to base a game around, and sure enough Five Ways Software have done so with the announcement of 'The Rats'.

Loosely based on the book, the object of the game is, perhaps unsuprisingly, to rid the world of the terrible danger that these rats pose.

Contact: Hodder and Stoughton Software, PO Box 702, Dunton Green, Sevenoaks, Kent TN13 2YD. Tel: 0732 450111.


THE
RATS
A new experience in software terror

Charging Rinos

Budgie Software, a new name in cheap tapes, has just released its first two titles for the 64. Both retailing at £2.99 the games, called 'Raskel' and 'Vortron', are both pretty traditional shoot-em-ups with some nice touches.

Contact: Rino Marketing Ltd, 1 Orange Street, Sheffield S1 4DW. Tel: 0742 739061.

Return of the Spy

Recently released by Beyond is the sequel to the well received Spy vs Spy, called Spy vs Spy II, The Island Caper. Using the same excellent graphics techniques the game involves collecting the secret weapon and escaping the Island by submarine. The sound is nice and if you were a fan of the first game I think this will also grab you. £9.99.

Contact: Beyond, Lector Court, 151 Farringdon Road, EC1R 3AD. Tel: 01-837 2899.

1÷1=2

An odd sounding new title from Quicksilva is Schitzophrenia. Playing a Laboratory (no I said Laboratory!) cleaner who in his wisdom manages to fiddle with a machine and split his personality. The rest of the game consists of you cleaning up after your alter ego and trying to reach the Combiner to put yourself back together again. £7.99.

Contact: Quicksilva, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666.

Hit and Miss?

A new title for the C16/Plus 4 is Hit and Miss from Venturegate. An odd sounding game (?) it is described as testing your mind, and not your arcade ability. You are, according to the press release, only required to use "simple logical though waves and a need to measure your intelligence". I look forward to a revealing review soon!

Contact: Venturegate Ltd, 17 Harold Road, Leeds LS6 1PR. Tel: 0532 568252.

Musical Bladerunner

"A video game interpretation of the film score by Van Gelis". That's CRLs description of its latest game. Due for release on the 25 September, the game follows the films ideas by placing you in the role of a Bladerunner who must travel about 'retiring' rogue replicons.

The game has two phases, firstly locating the Replicons from the air and secondly chasing and killing them along the ground.

Contact: CRL Group PLC, Kings Yard, Carpenters Road, London E15 2HD. Tel: 01-533 2918.

Cylu

New from the silver label of Firebird is Cylu. A 3-D graphical adventure similar in many ways to the Ultimate series of games it has nice graphics, and at only £2.50 it looks like pretty good value for money.

Contact: Firebird Software, Wellington House, Upper St Martins Lane, London WC2H 9DL. Tel: 01-379 6755.

PRIZES GALORE!!!

WIN . . . the 128 and 1571 disk drive

Our star prize this month, provided by Commodore, is the just-released 128 plus the 1571 disk drive – both of which received favourable reviews in our September issues.

All you have to do to win this superb package worth around £500 is to answer the following three questions. Our prize winner will be whoever answers question one correctly and provides the most convincing answer to the second and third questions.

Answer the following questions:

1 Which port does a disk drive plug into?

2 Name and describe a basic command you wish that the 64 had?

3 Name your favourite game and, in less than 30 words, tell us why it is?

WIN . . . A 1541 disk drive

We have not one, but five, 1541 disk drives to give away absolutely free!

Throughout the magazine you will find six easy questions. Find them and fill in the answers in the space provided below.

The senders of the first correct entries pulled from our sack will each receive a 1541 disk drive.

Enter the answers to the questions placed throughout the magazine in the space here.

1

2

3

4

5

6

WIN . . . Summer Games II

Summer Games II is set to be a winner as you can see from our mega-review in this issue. We have 25 copies, courtesy of US Gold, of this disk-based game to give away.

In order to win, you have to tell us what you think are the top five best-selling disk-based games of 1985.

We will base the Top Five on figures provided by leading distributors.

The Top Five best-selling disk based games are:

1

2

3

4

5

Entries must reach us by 30 October 1985 and should be sent to:

Disk Competitions,
Commodore Computing International,
40 Bowling Green Lane,
London EC1R 0NE

If you don't want to cut up the magazine, photo-copy the page and send it off to us.

Your name:

Address:

Exterminator Is Back

In this months SPRITE CORNER we see the return of the EXTERMINATOR. Anthony Mangnall and Timi Dabor have brought him back to demonstrate some more sprite capabilities, namely, Sprite/Character Priorities, and beware, this little monster even packs a Punch!

Type in the new listing very carefully, save it and then 'run' it. Those readers that saved the original exterminator program listing may save a lot of time by adjusting the original to incorporate the extra lines.

The program listing again contains the data for four sprite images. When 'run' the computer will create from this data the usual for MIRROR images, so there will be a short delay to allow for the data conversion. The program will also generate a graphic screen consisting of two rows of buildings, one at the top and one at the bottom of the display. The sprite is allowed to move along the space between the two rows. Movement of the sprite may be controlled by either KEYBOARD or JOYSTICK (PORT 1), and when the sprite is moved to the top of the screen and then across, it will pass in front of the characters that make up the buildings. If you then move the sprite to the bottom of the screen and across, it will pass behind the character display. It should not be too difficult to work out which lines control the priority code.

We also warned that our little friend (or fiend) has armed himself since he last appeared in this column. Move the sprite to the centre of the screen and press the 'S' key if you are using keyboard control, or the 'fire button' of your joystick, and a missile will be despatched in the direction that he happens to be facing at the time.

```
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'EXTERMINATOR II'
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    *   **  **
     * ********
  **  *********
    *** * * * *
  **   ********
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    ** * * * * **
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  ** * * * * * *
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**              *
***  ********  **
   **        **
```

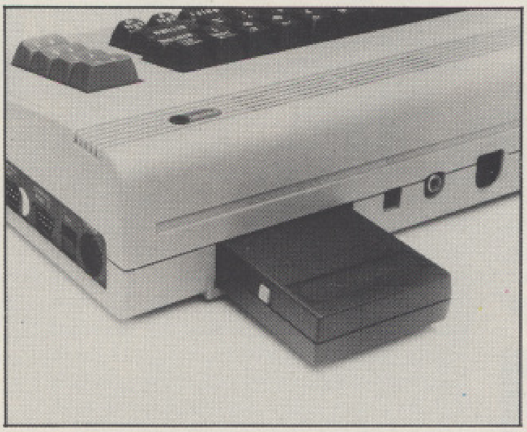
```
READY.


1 REM ** EXTERMINATOR II ** BY TIMI DABOR/TONY MANGNALL (C) AUGUST 1985
2 POKE53280,11:POKE53281,15
4 PRINT"♥":POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)AND251
5 FORI=0TO2048:POKE8192+I,PEEK(53248+I):NEXT:POKE1,PEEK(1)OR4
6 POKE56334,PEEK(56334)OR1
8 FORJ=8472TO8472+39:READX:POKEJ,X:NEXT
10 V=53248:X=150:Y=150:DX=3:DY=3:W=256:P1=223:P2=227
20 FORI=0TO7:Q%(I)=W/2:W=Q%(I):NEXT
30 PRINT"♥████Q W E":PRINT"██\I/":PRINT"██A——D":PRINT"██/I\":PRINT"██Z X C"
40 PRINT"II███████KEYBOARD CONTROL/JOYSTICK PORT 1"
70 POKE V+21,1:POKEV+39,0:POKEV+40,0
71 FORI=0TO62:POKE14848+I,0:NEXT:POKE14876,63:POKE14873,255:POKE14877,192
80 FORI=0 TO 3:FORN=(223+I)*64 TO (223+I)*64+62:READ Q:POKEN,Q:NEXTN,I
90 PRINT"██████████CONVERTING DATA INTO MIRROR IMAGE"
100 PRINT"███████THERE WILL BE A SHORT DELAY "
110 REM     GET THE SPRITES MIRROR IMAGES
120 FORI=0TO3:FORP=0TO62STEP3:FORT=2TO0STEP-1
130 UI=PEEK((223+I)*64+P+(2-T)):MR=0
140 FORR=0TO7:IFUI<Q%(R)THEN160
```

```
150 MR=MR+(128/Q%(R)):UI=UI-Q%(R)
160 NEXTR:POKE(227+I)*64+T+P,MR:NEXT T,P,I
170 POKE53270,PEEK(53270)OR16:POKE53272,(PEEK(53272)AND240)OR8
171 FORK=1TO5:H1$=H1$+"   ▩◤◥     "
172 H2$=H2$+" ◤  ◥   ":H3$=H3$+"◤      ◥   ":H5$=H5$+" ▩&&&&    "
173 I1$=I1$+"▩'%%%'''":I2$=I2$+"▩%▩&&&&▩%%":H8$=H8$+"▩%%%%%%%"
174 H4$=H4$+" ▩%%%    ":H6$=H6$+"▩%▩&&▩%▩&▩%%":H7$=H7$+"▩'''▩%▩''''":NEXTK
175 PRINT"▩▩▩▩▩▩"H1$H2$H3$H4$H5$H6$H7$H8$;
176 PRINT"▩▩▩▩▩"H1$H2$H3$I1$I2$I2$;
190 P=PEEK(197):REM   KEYBOARD SCAN
200 JY=PEEK(56321)AND15:REM   JOYSTICK SCAN  ( PORT 1 )
201 J=PEEK(56321)AND16:IFJ<>16ORP=13THENBU=1:BX=X:BY=Y:BQ=Q:GOSUB403
202 IFBU=0THEN210
203 POKE2041,232:POKEV+21,PEEK(V+21)OR2:IFBQ=1THEN207
204 IFBX<320THENBX=BX+4:GOSUB403:GOTO210
205 BU=0:POKEV+21,1:GOTO210
207 BX=BX-8:GOSUB403:IFBX<=22THENBU=0:POKEV+21,1:BX=0
210 IF JY=10 OR P=62THEN X=X-DX:Y=Y-DY:Q=1:REM  UP LEFT
220 IF JY=14 OR P=9THEN Y=Y-DY:REM              UP
230 IF JY= 6 OR P=14THEN X=X+DX:Y=Y-DY:Q=2:REM  UP RIGHT
240 IF JY=11 OR P=10THEN X=X-DX:Q=1:REM         LEFT
250 IF JY= 7 OR P=18THEN X=X+DX:Q=2:REM         RIGHT
260 IF JY= 9 OR P=12THEN X=X-DX:Y=Y+DY:Q=1:REM  DOWN LEFT
270 IF JY=13 OR P=23THEN Y=Y+DY:REM             DOWN
280 IF JY= 5 OR P=20THEN X=X+DX:Y=Y+DY:Q=2:REM  DOWN RIGHT
290 IF Q=1 THEN320
300 POKE 2040,P2:P2=P2+1:IF P2=231THEN P2=227
310 GOTO 330
320 POKE 2040,P1:P1=P1+1:IF P1=227 THEN P1=223
330 POKE V+1,Y
331 IFY>150THENPOKEV+27,PEEK(V+27)OR1
332 IFY<150THENPOKEV+27,PEEK(V+27)AND254
340 IF Y<=129 THEN Y=129
350 IF Y>=198 THEN Y=198
360 IF X<22 THEN X=22
370 IF X>320 THEN X=320
380 IFX>255THENOF=1
390 POKE V+0,X-256*OF:IFOF=1THENPOKEV+16,PEEK(V+16)OR1
391 IFOF=0THENPOKEV+16,PEEK(V+16)AND254
400 OF=0:GOTO 190
403 IFBY>150THENPOKEV+27,PEEK(V+27)OR2
404 IFBY<150THENPOKEV+27,PEEK(V+27)AND253
405 FI=0:POKEV+3,BY:IFBX>255THENFI=1
406 POKEV+2,BX-256*FI:IFFI=1THENPOKEV+16,PEEK(V+16)OR2:RETURN
407 POKEV+16,PEEK(V+16)AND253:RETURN
410 REM     DATA
411 DATA 2,5,11,21,42,85,170,106,128,64,160,80,168,84,170,85
412 DATA 170,85,170,85,170,85,170,85,215,215,215,85,215,85,85,85
413 DATA 253,253,253,85,223,223,223,85
420 DATA 0,7,128,0,15,192,0,115,224,0,31,224
430 DATA 0,31,224,0,11,64,48,31,224,15,255,224
440 DATA 48,58,160,0,223,224,3,58,176,1,117,80
450 DATA 0,234,168,1,213,88,3,170,176,6,0,16
460 DATA 13,85,88,14,127,152,1,128,96,0,0,0,0,0,0
470 DATA 0,7,128,0,15,192,0,115,224,0,31,224
480 DATA 0,31,224,0,11,64,3,31,224,0,255,224
490 DATA 3,42,160,0,95,224,3,181,80,1,106,176
500 DATA 0,213,88,1,170,168,3,85,80,6,0,16
510 DATA 13,85,88,14,127,152,1,128,96,0,0,0,0,0,0
520 DATA 0,7,128,0,15,192,0,115,224,0,31,224
530 DATA 0,31,224,1,159,224,32,111,224,16,63,224
540 DATA 31,234,160,16,31,224,32,63,240,0,117,80
550 DATA 0,234,184,1,213,88,3,170,176,7,85,80
560 DATA 12,0,8,14,127,152,1,128,96,0,0,0,0,0,0
570 DATA 0,4,128,0,15,192,0,27,96,0,31,224
580 DATA 3,31,224,0,140,192,0,95,224,3,63,224
590 DATA 0,234,160,3,31,224,0,53,80,0,106,176
600 DATA 0,213,88,1,170,168,3,85,80,6,170,176
610 DATA 12,0,8,14,127,152,1,128,96,0,0,0,0,0,0
```

CCI

THE SECRET BEHIND THE NEW COMMODORE 64



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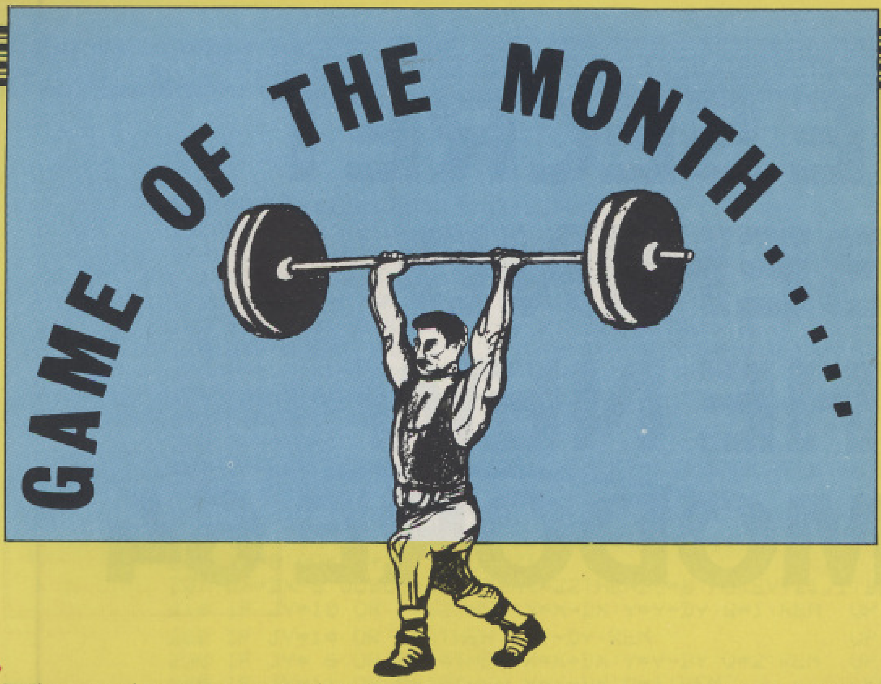
GAME OF THE MONTH...

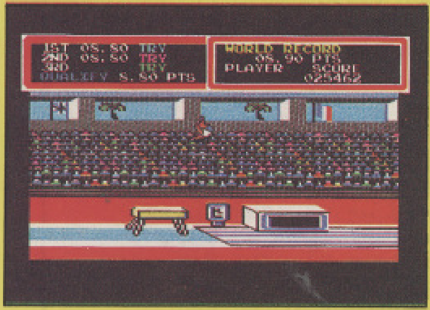


Split personalities? Well no, not quite . . . but Imagine's Hypersports certainly split the CCI panel

This month's game is another sports program, this time from Imagine. Designed to be as similar as possible to Konami's extremely popular arcade game Hyper Sports, it sticks closely to the winning sports simulation formula but even so the CCI panel had — to say the least — varied opinions of it!

One criticism everyone had was well voiced by R J Penfold, 28, of Southampton when he said: "Unfortunately for this program, it is far from the first in its field, and I'm afraid can't help but be compared with Summer Games or Daley Thompson's Decathlon".

Even though it is not the first, Craig Pemberton, 14, of Merseyside said: "Hyper Sports is the latest in a line of sports simulations from Imagine, and the best yet!".



As usual for Imagine the game was programmed to a very high standard but the sound caught everyone by surprise. As 17-year-old David Cooper of Northwich in Cheshire said: "The music is the best single feature of the game; it has to be the best music I have ever heard on my 64".

Mrs Elizabeth O'Brien, 34, of Cheshire agreed wholeheartedly with this and added: "The graphics are excellent, and the sound track whilst loading is one of the best I've ever heard, a beautiful rendition of Chariots of Fire, with some brilliant sound effects thrown in for good measure."

R J Penfold describes the game thus: "There are a good range of sports covered by this program, all held in memory. These are swimming, skeet shooting, long horse, archery, triple jump and weight lifting".

Kevin Exley, 28, of Leeds praised the game and said of the method of play: "Each of the six events displays the 'world record' which is beatable, and the qualifying criteria which has to be achieved to move on to the next event."

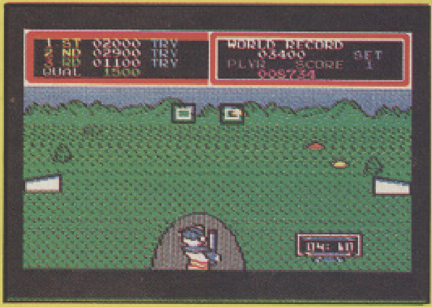
The event that caused most disagreement amongst our panel was the Archery, unlike swimming which — due to its joystick killing antics — was not a favourite, some people loved Archery and some, such as 13-year-old Martin Younger, also of Cheshire, hated it. He said: "The graphics in this are pathetic, first of all you have to press fire to find out the wind speed, you must then fire arrows as near to five degrees as you can at a moving target. It is very easy and if you qualify the man jumps up in the air in delight".

R J Penfold didn't agree, he said of Archery: "This was my personal favourite, where you are not just relying on speed or dexterity of joystick."

Corporal T P Ruckwood of Hampshire liked the game due to it's originality and comments: "The graphics are fantastic! The arcade style characters are colourful and well defined, and the animation is on par with the best.

"There are lovely touches throughout the game, such as whistling crowds when a world record is broken, and your player pounding the floor with disgust if he fails to qualify."

The best way to show how mixed the feeling of our panel was, is in the conclusions. They are amazingly varied, with people expressing views about as opposite as possible. Also surprising is that it was not just the younger members of our panel that liked the game.



CONCLUSIONS

"Even though **Summer Games** has been around a fair old time now, it still **stands out head and shoulders above** this one with better graphics and playability" — Penfold.

"**The game has everything,** the gameplay, the graphics and as for the sound!! I can hardly fail to recommend this value for money game. The sound track alone is worth the money, it's so good I could listen to it all day. Perhaps I will" — Ruckwood.

"The **graphics throughout this game are excellent,** a lot of hard work has obviously been put in. I'm sure Imagine will be repaid by high sales!" — Cooper.

"It is quite good but it is **not original** and I wouldn't rush out to buy it." — Younger.

"In conclusion I think **this is a gold medal game** and deserves a high ranking against it's competitors." — Exley.

"On the whole I did not care much for this game, although I must say that **it is well done,** unless you are a real sports fan I'd give this one a miss." — O'Brien.

"As an almost exact copy of Konamis arcade game it has to be the **best sports simulation ever** to hit the 64. Loved it!!" — Pemberton.

Sort that lot out if you can!!

Contact: Imagine Software Limited, 6, Central Street, Manchester M2 5NS. Tel: 061-834 3939.

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The continuing saga pits allied forces against the cruel dictator who escaped the destruction of the fortress with remnants of his army and prisoners captured during the land battle.

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Illustration by Oliver Frey (Newsfield Publications) • Manufactured in the U.K. by U.S. Gold.

The Great M.U.D Challenge

MUD is the newest development in the ever-quickening movement of British Telecom into the home computer market. Using a Commodore you can access MUD as long as you have a suitable modem and software. Based on the popular game of dungeons and dragons, MUD has the advantage that up to 100 people will be able to simultaneously access the system eventually.

Designed to appeal not only to hardened adventure fans but to beginners who want more from an adventure than pre-programmed results. The success of MUD has been meteoric (well nearly!!!) since its early days of use at Universities and the newest version from Telecom should be a great improvement as is detailed in the magazine elsewhere.

This competition is open to all people who, with a little research, should be able to find all the answers and, using their imagination, should easily be able to think of an exciting character name and short description of a personality.

The prizes are all provided by British Telecom and more importantly the winner will be taken to the London Dungeon on November 5th for the first M.U.D Spectacular where he will compete with nine other MUDDERS to win an eventual prize of 100 hours of free MUD.

All entries must reach us by 1 October, 1985.

Send your entries to:

MUD Competition,
Commodore Computing International,
40, Bowling Green Lane,
London EC1R ONE.

First Prize:
1 MUD pack consisting of an account number, 30 credits (equivalent to three hours play), a map, and an introduction to MUD manual. Plus on-line tuition from an Arch Wizard!

Runners up:
There will be five runners up prizes of three pieces of Firebird Silver label software.

Answer the following questions:

1. In which university did MUD originate?

____

2. Where will the Brolly be found?

____

3. What (in less than 30 words) would be your characters name and distinguishing characteristics? ______________________________

____

____

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THE 4TH PROTOCOL (Hutchinson)

Frederick Forsyth's latest novel is "The 4th Protocol": a nuclear bomb has been smuggled into Britain for detonation just before the 1987 General Election to destabilise the nation. Now the book's been turned into a superb computer adventure. Using icons to avoid typing text, it's actually three adventures and you can move on by completing each. The reviewers have raved and we agree. It's brilliant!
"The icon graphics are excellent; the speed is incredible. It's one of the most enjoyable, complex, but easy to operate games I've played in a long time" - Sinclair User.
"Has all the elements of the best-selling novel. A fascinating concept. Can keep you happily spying for hours" - Commodore Computing International.
£12.95 [C] Commodore 64
£15.95 [D] Commodore 64
£12.95 [C] Spectrum

THE ROCKY HORROR SHOW (CRL)

Based on the hit rock music show, seconds after loading the game you'll be in the strange mansion of Frank N. Furter. You need to find the bits of the De-Medusa machine rather quickly or the mansion changes into an alien spaceship and lifts off before you can count down from 10! You choose at the start whether to be Brad or Janet. Part of your task is rescuing the one you're not but that's over-simplifying things!
"Rocky Horror looks good, sounds good and is very addictive - just like the show itself!" - Computer & Video Games.
£8.95 [C] Amstrad £8.95 [C] Commodore 64
£8.95 [C] Spectrum

DAM BUSTERS (US Gold)

The raid on the key German dams during World War II captured the imagination of generations. Now it's a really well-done computer simulation, which would have amazed Dr Barnes Wallis, inventor of the raid's bouncing bomb. This isn't just a flight simulation - you play seven different parts: the personnel required to fly a Lancaster on a dam-busting raid and that's challenging, to say the least!
"This is the flight game. It has the edge because of the historically accurate mission you undertake. Excellent and I can thoroughly recommend it" - Commodore User.
"Should keep trigger-happy computer owners contented for quite some time" - Computer & Video Games.
£11.95 [C] Commodore 64
£14.95 [D] Commodore 64

WAY OF THE EXPLODING FIST (Melbourne)

Take our word for it - nothing we can say will do justice to this stunning program. The title tells all: it's a one or two person karate simulation. Top of the software charts within two weeks of being released, it shouldn't be confused with other kung-fu arcade games. This program has art and skill in abundance as you attempt to become a Tenth Dan. Almost every karate move is duplicated and therefore possible, and the amazing graphics give the two fighters startling realism.
"Playing this karate simulation brought out many violent reactions in me as I kicked and chopped. Has one-more-go addictiveness" - Commodore Computing International.
£9.95 [C] Amstrad £9.95 [C] Commodore 64
£8.95 [C] Spectrum

ELITE (Firebird)

This has been one of the most eagerly awaited programs in years. Elite was first written for the BBC computer and it's been translated for the 64 by its authors, Ian Bell and David Braben. It's a brilliant mix of 3-D space laser combat combined with shrewd bartering and trading. The 64 version has new aspects to heighten the fascination exerted on everyone who tries it.
"To explain every element of Elite would take a book. You'll run out of energy long before Elite runs out of things to show you" - Commodore Computing International.
"Brilliant. Certainly the best I've seen this year. Truly a mega-game" - Zzap 64.
"It's a flight simulation of some merit, a strategy game requiring careful planning, and a damn good shoot 'em up, all rolled into one" - Your Commodore.
£14.95 [C] BBC £14.95 [C] Commodore 64
£17.95 [D] BBC £17.95 [D] Commodore 64

A VIEW TO A KILL (Domark)

At last a 007 James Bond graphic adventure has arrived and it's good. Graphically excellent, it won't come as any great surprise to learn it's based heavily on the film of the same name. The gratifying part is its value for money: no less than three challenging games in the one package. And there's the added challenge of not being able to progress to the next until the last is mastered.
"This is a huge game with many interrelated elements that make it extremely playable. For any Bond fans, this game is a must" - Crash.
£10.99 [C] Commodore 64 £10.99 [C] Spectrum

DUN DARACH (Gargoyle)

The follow-up to the superb Tir Na Nog. The main object is to locate and release Loeg who's hidden in the city of Dun Darach. The detailing of the streets is first class with each one named and every house and shop numbered. But with over 100 streets, more than 40 shops and other locations, plus strategies beyond belief, finding Loeg is a mighty challenge!
"Offers many levels of play and games within games. Goes well beyond the sophistication of Tir Na Nog. How Gargoyle packed so much in I'll never know. There's just so much going on it's unbelievable. Terrific - just buy it!"
Crash.
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The Invisiclue range is listed in full in the super Post Haste catalogue!

SUPER PIPELINE II (Tasket)

This is even more addictive than Super Pipeline. The screen is filled with a twisting turning pipe. Water flows through it to fill a barrel, but only if the pipe's not punctured. Which it is, regularly, by an assortment of nasty Things. Happily, your plumber's mate (if you catch him) will happily hammer rivets into the breaks. Fill the barrel and you get an even more ferociously twisted pipe. Here's that rare thing: a good game that's original!
"I really liked this. Humour permeates the game, down to the C5 and lecherous worker on the in-between screens. I'm swamped!" - Home Computing Weekly.
"Good cartoon-like graphics which are very well drawn and animated. I'm very addicted to it as it is so playable" - Crash.
£8.90 [C] Amstrad £8.90 [C] Commodore 64
£8.90 [C] Spectrum

FRANKIE GOES TO HOLLYWOOD (Ocean)

This may be the biggest program of the year. Produced by the team responsible for "Shadowfire", FGTH (as it's sure to become known) puts you in Everydaysville, a boring place where nothing exciting happens. Until, that is, a murder is done! Behind Everydaysville lies the Pleasuredome and in there lie so many adventures, layers, games, riddles and paradoxes that listing them all just isn't possible. If you solve them you'll progress to being a Complete Personality.
"Variety is the keyword in this highly unusual game which has gone far beyond what anyone expected" - Crash.
"Quite unique in its concept. It impressed me as it has the best of both worlds - action and strategy - and a number of slick touches to keep you on your toes" - Computer & Video Games.
£9.95 [C] Commodore 64 £9.95 [C] Spectrum

CONFUZION (Incentive)

Warning: *Confuzion* is VERY addictive! The action is in a 64-storey bomb factory, with each floor made up of sliding panels. Each panel contains a length of fuse and your job is to arrange them so that a spark can reach a bomb. It's a race against another fuse, burning merrily away at the top of the screen and things get tougher as you proceed. Totally original but remember: you may spend much more time than you should on *Confuzion*.
"One of the best and most original programs I've seen on any micro in years" - Home Computing Weekly.
"Hellishly addictive" - Your Commodore.
"This fast moving puzzle game will have you hooked as soon as you start playing!" - Computer & Video Games.
£6.95 [C] Amstrad £6.95 [C] Commodore 64
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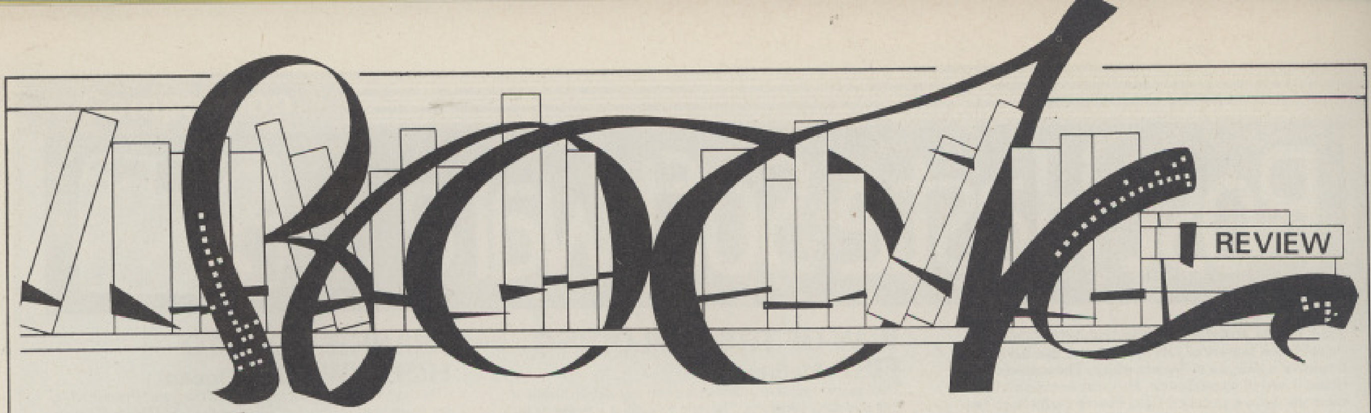


SILICON VALLEY FEVER
by Judith K. Larsen and Everett M. Rogers – £12.95

There are 15,280 millionaires living between Los Altos Hills and Atherton. That accounts for a third of the 30 mile strip in Santa Clara County they call Silicon Valley. The other two thirds are covered with a total of over 3,000 electronics firms. It is no coincidence that the greatest concentration of new wealth in the United States is gathered in this, the birthplace of pocket calculators, digital watches, video games, cordless telephones, microprocessors, laser technology and of course, home computers. Silicon Valley Fever examines in a very personal way the infancy through to the present day maturity of this hi-tech society. It begins with – as Life magazine put it "the ultimate success story" Apple Computer Inc.

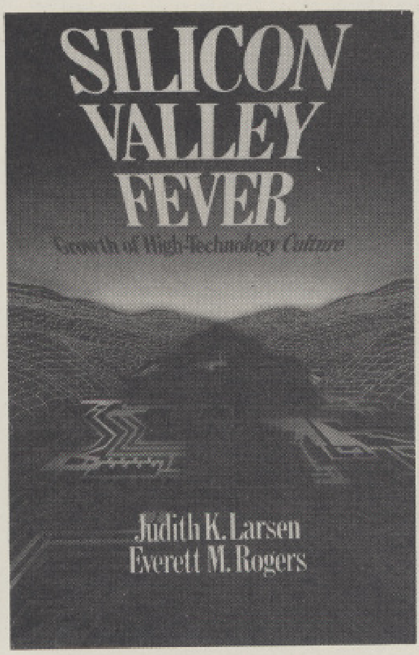
Nearly thirty years ago when Santa Clara county was famous for being the "Prune Capital" of the USA, the microcomputer was only available for real enthusiasts who were prepared to buy it in kit form and were willing to spend a few thousand dollars for machines with few real applications. Steve Jobs and Steve Wozniak wanted one but couldn't afford it so they decided to make their own, in Jobs' garage in Los Altos, California. Having put together their first Apple in sixty hours (incorporating a cheap microprocessor bought at an annual computer show), they then proudly showed it off at The Home Brew Computer Club (a group of like minded computerphiles who met at the Campus of Stanford University). Such was the interest they aroused that they went back, cut their production line down and inadvertently launched the microcomputer industry.

From garage to multi-millionaire making organisations through the technical genius of Wozniack and the tenacity of Jobs. Why the name "Apple'? Jobs was once a fruitarian; natural choice. Could it have happened anywhere else in the world in the same way? Probably not, as the environment of Silicon Valley plays a critical part.

Apple, just one of the many great entrepreneurial successes which now litter the valley with gold – incidentally $1.5 million worth of gold, silver and other metals are sifted from the city sewers every year.

year.

Silicon Valley has its beginnings in the semi-conductor industry and the Shockley eight. Dr. William Shockley, co-inventor of the transistor (Nobel prize winner in 1956), started the Shockley Semiconductor Laboratory in his home town, Palo Alto. He then recruited eight bright young men exclusively in Silicon. All are millionaires today.



But not all companies in Silicon Valley go the same way. Many end up bankrupt or taken over (which is not always good news) and some have what the book describes as "adolescent transition" problems – when the growth rate of the company is such that it neglects an aspect of production or managerial tasks and runs into problems. Such as the case of Verbatim.
from Laboratories on the East Coast. Initially attracted by his scientific reputation, they had all quit in the first year unable to budge him from his decision to concentrate R & D on four-layer diodes whilst they were convinced that silicon transistors were the future. They started up their own firm Fairchild Semiconductors working

Reid Anderson, an electrical engineer, founded Verbatim after working for Bell Laboratories for 24 years in electronics R & D; convinced that magnetic tape would replace paper in computer data storage. When floppy disks were introduced by IBM as a sideline and looked like taking over the tape market, Anderson approached IBM to license the disks and got their agreement. Sales then rise astronomically to $14.7 million on paper by 1979. But then comes the adolescent transition in which Verbatim changed the liner paper on the jackets enclosing the floppy disks, and were so concerned with expansion, that adequate monitoring tests weren't carried out and because of problems had to recall its 8" floppies in 1980. Verbatim eventually recovered. But not all the engineer-founders are good corporate managers.

Silcon Valley Fever examines the lifestyles of the people who live in this community starved of art except in the high-tech form – "the San Jose Black Theatre Workshop present "Electrobucks" a comedy centering on working in an electronic plant"; With limited recreational activities "don't think about the difference between work and play, and there isn't any", houses within a 20 mile radius minimum price of $120,000 and exploited migrant women assembly line workers. It shows us a society which is being duplicated around the world – France, Germany, Japan and indeed the UK with its share of Valleys and even Silicon Glens.

The revolution of today is a high-tech information revolution much much faster than its predecessor the industrial one. Technology is changing at a feverish pace. Silicon Valley Fever gives one a good insight into future, presented in a very readable way.

As San Jose's radio station announces: ". . . Broadcasting from Silicon Valley, World Headquarters of the 21st Century." Now you know.

Contact: George Allen & Unwin, 40 Museum Street, London WC1.

Max Jacobson

Book REVIEW

Computer journalist Peter Arnott-Job evaluates a selection of newly-released books.

WATSON'S NOTES 1: COMMODORE 64; FIRST STEPS IN BASIC and WATSON'S NOTES 2: COMMODORE 64; EXPLORING BASIC by D Kedem and I Kalisky — £2.95 each

SCREEN SHOT PROGRAMMING SERIES: STEP BY STEP PROGRAMMING; COMMODORE 64 GRAPHICS BOOKS THREE AND FOUR by Phil Cornes — £5.95 each

These are four very good teaching books in two series and they illustrate some of the difficulties encountered in educating people about computers. Teaching adult beginners about computers means starting from scratch, introducing entirely new concepts which the adult mind, having become set in its ways, often finds difficult to accept. The concepts may be basic and simple but many adults do find them difficult to get to grips with. It is therefore very difficult to teach adults about computers without seeming patronising and lapsing into the sort of techniques used to teach children.

I know people who have had to resort to computer books aimed at children because they can find no books about computers written in an adult way.

Children's minds, on the other hand, are far less cluttered and are much more open to new concepts. But the problem with teaching children is that the words you have to use can be very difficult for them to handle. How do you explain to them that such simple words as IF, THEN, ALSO, FOR don't necessarily mean what they've been taught they mean. And what about all those jargon words — peripherals, routines, monitor (someone who dished out the milk at school — when we used to have milk!)? Then there are 'big' words that even adults have difficulty understanding.

So with adults you have to avoid being too childish but with children you must avoid being too adult!

On the whole these two series manage to tread the path through the quicksand successfully. The Dorling Kindersley series is entirely successful while the Watson's Notes series strays very occasionally from the path and once or twice is in danger of getting bogged down. The DK series takes an adult approach while Watson's Notes is aimed at children.

The DK series deserves the critical accolades it has received from other reviewers — 'outstandingly good' and 'excellent'. These two latest additions to the series explain graphics on the 64 cogently, intelligently, understandably and, above all, graphically. The pages are full of illustrations and one can't help wondering if design hasn't taken precedence over content. The approach is rather like that of the partworks such as Input and Computer Course (Marshall Cavendish and Orbis respectively) — a logical, 'step by step' approach.

The Watson's Notes series takes a similar step by step approach but is much more of a tutorial. It demands the active participation of the reader: 'Do this, it says and then asks the reader to describe what happens. 'Do' that, commands the book. 'What happens?' it asks. 'Now do this *and* that.' 'What happens?' It's acknowledged that active participation ensures that the lessons are learnt and remembered. The only problem with the book is its occasional lapse into jargon. In spite of this it can be highly recommended. It's mainly for kids — probably between 7 (with some adult help) but if you're an adult who's a beginner and you're prepared to accept the childish approach for the sake of a good education then you could do a lot worse.

The contrasting prices of these two books are interesting. The DK series is too expensive. Although reviewers have praised the series it's all too easy to forget, if you're getting the books free, that other people have to pay for them. Excellent they may be, but at £5.95 you're paying nearly 10p a page. 7p for the packaging and 3p for the content?

The Watson's Notes books are £2.95 and represent excellent value for money, although buying up all six in the series (there are more planned) could prove expensive.

Contact: Glentop Publishers, Standfast House, Bath Place, High Street, Barnet, Hertfordshire EN5 1ED. Contact: Dorling Kindersley, 9 Henrietta Street, Covent Garden, London WC2E 8PS.

SOUND EFFECTS AND MUSIC ON THE COMMODORE 64 by William Turner and Alf Vella — £6.95

If you're at all interested in sound on the 64 then this would be a very worthwhile addition to your shelves. Many other books on sound and music cheat by spending a great deal of time on the theory of music. If you want to know about the theory of music you should buy a music book. If you want to know how you can create sound on the Commodore 64 then buy this book. Turner and Vella don't go into music theory although they do spend some time on the physics of sound.

In fact this is one of the book's advantages. It starts off with one of the best explanations of sound that I've read in a computer book. Throughout it keeps a firm grip on the subject, describing exactly what is happening, not only inside the computer, but in the air around you as the sound is created.

This is much more statisfying and useful than simply being told 'Do this and to that and you'll get such and such a sound.' This sort of approach enables you to fully understand what's going on and gives you a much better chance of going off and doing your own thing successfully.

Don't expect this book to turn you into an accomplished musician. The plain truth is that you won't really have a chance of becoming an accomplished musician with the 64 alone. You'll need at least a piano keyboard. And if you really want to get into music on the 64 you'll have to splash out on some sophisticated MIDI (Musical Instrument Digital Interface) equipment. What this book will do is teach you a hell of a lot about how sounds are created on the 64. I don't think you can really ask for too much more. (If you want more about music and MIDI systems see Electronic Music on the Commodore 64 by Mark Jenkins, Sunshine Books, £6.95. In fact, these two books are complementary).

Contact: Duckworth, The Old Piano Factory, 43 Gloucester Crescent, London NW1.

WINNING AT THE RACES USING YOUR COMPUTER by Paul Worden — £6.95

Let's get one thing clear. This book offers no infallible system which will make you the world's most successful punter (along, that is, with the author and all the other readers of the book). Nor does it make any such claims. The author explains right from the beginning that there is no such thing as the perfect betting system. There are simply methods of improving your chances of winning. These methods nearly always involve a lot of statistical data and computers are ideally suited for handling such data.

Your professional punters — and there are a few very successful punters around — do have a system. It's called hard work. Interminable hours spent poring over pages and pages of figures. Visits to race meetings to bet on just one horse in one race.

The thing with horse racing is that it ought to be predictable but isn't. If horse A beats horse B who then beats horse C then horse A ought to beat horse C. Unfortunately, or otherwise, that doesn't always happen. There are reasons why, of course. But finding out exactly what those reasons are can prove almost impossible. The problem is that there are so many variables involved.

Paul Worden believes in concentrating on a few of the most important variables — form over the distance he seems to rate most important. The main point is that approaching betting on horses in an organised, scientific way is (almost) certain to give you a distinct advantage over the other punters who may be just as influenced by an attractive name as good form.

The best horse always wins and, on average, the same horse will win more often than not if he's facing the same opposition. Given the right sort and amount of information it ought to be possible to predict the winner more often that not. That's how professional punters win — they have more winners than losers.

Paul Worden's book is fascinating if you're interested in horse racing and computers. It makes no outrageous claims but I am sure that it will certainly give you a better chance of winning.

Contact: Interface Publications, 9/11 Kensington High Street, London W8 5NP.

PLUS/4 MAGIC FOR BEGINNERS by Bill Bennet — £9.95

This is quite a helpful book with a particularly unhelpful title. Surely it's not unreasonable to assume that we have left behind the days when computers were considered as something magical and mysterious? Wouldn't most people expect, as I did, that a book with the word 'magic' in the title would refer to the Paul Daniels brand of magic — clever tricks which leave us wondering how it's done, knowing full well that there's nothing truly 'magical' about it at all

The title leads you to expect a book of tricks — especially since the front cover illustration is of a magic wand and a top hat. But it's another guide to the Plus/4. There's nothing magic about it at all and the way that the word is used in the title is intended to refer to the magical properties of computers. Well, you can look up to computers as the modern equivalent of witch doctors but to me they're just banks of switches no more capable of *real* magic than Paul Daniels.

This is a plain, straightforward, rather mundane beginner's guide to the Plus/4. Like most of the other beginner's guides — no matter what the machine they're intended for — this is a book about elementary programming. There's the usual introduction to the hardware, software and peripherals followed by a step by step guide to the Plus/4's Basic Version 3.5. It's a sort of improvement on the 64's Basic but is heavily weighted towards the 'fun' things like graphics and sound.

Plus/4 Magic for Beginners is reasonably well written, friendly and understanding without being hysterically chatty. This gives it a distinct advantage over many of the other books in the field. It's a book that can be recommended with one or two reservations. It's adequate rather than exceptional and it's too expensive.

Contact: Castle House Publications, 27 London Road, Tunbridge Wells, Kent TN1 1BX. **CCI**

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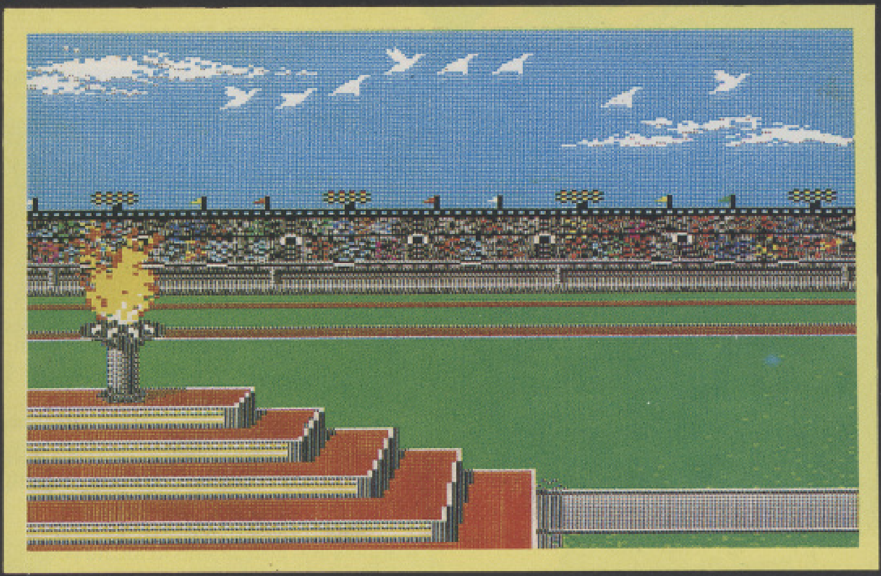
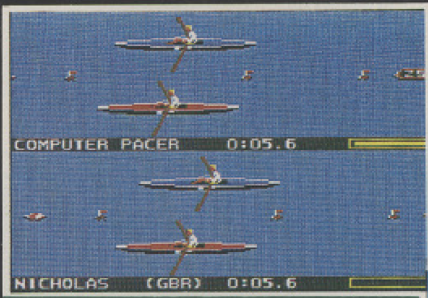
Mega-Review

SUMMER GAMES II

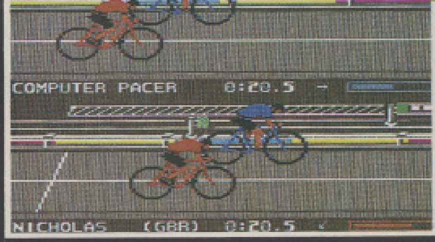


When the spate of sports games first arrived on the scene last year, I was asked to put them in an order of merit. Having done so I then compared this with the charts of the moment, only to find that I had placed them in reverse order! I really thought that Summer Games would be a huge success and that the joystick-snapping antics of Daley Thompson's Decathalon would earn little favour. Having been proved so totally wrong once, I am still willing to stick my neck out and say that *Summer Games II will be the biggest success of this period of the year.*

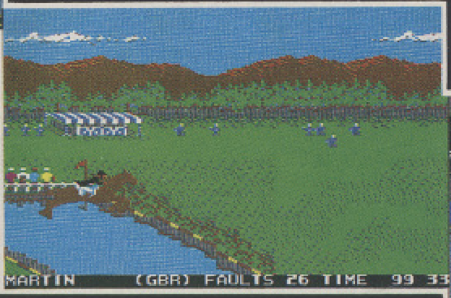


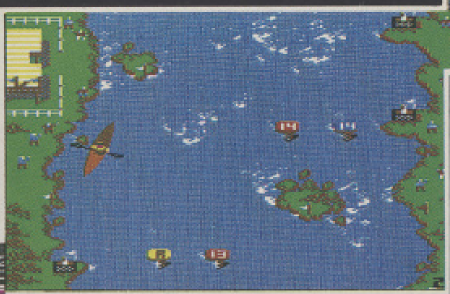
Summer Games II provides you with eight more events to challenge not only your speed of finger movement but also your timing and judgement. When the game is first loaded you must enter your name and choose the country you wish to represent out of the 18 available. Having done so you are then asked whether you want to compete in all events, compete in one event, practice one event and five other options. If you choose to compete in all events you are thrown immediately into your first event – the triple jump.

At first glance it looks rather like a normal long jump, but once you start playing you realise that it is much more difficult as you must co-ordinate four movements. Thankfully speed is built up for you so you can concentrate on your hop, skip and jump. *The scrolling is absolutely beautiful without so much as a flicker* and if you complete a jump successfully you not only receive cheers from the crowd but you see an action replay of your jump on a small screen above the main stand.



Next you must compete in the rowing. Really it is single sculling, but all the same it demands concentration and you really feel that each stroke drains a little more from you. In both this and all the cycling you have a computer pacer which keeps you going, meaning you always have someone to race against.

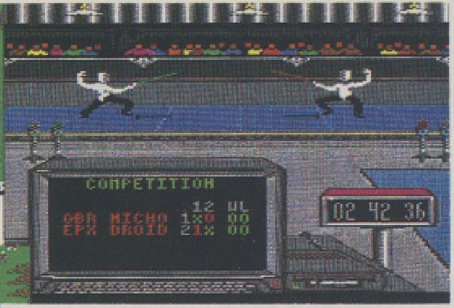




The javelin event is a pretty standard implementation with the fire button being used for speed and the joystick for drawing your arm back and releasing the javelin. Perhaps the most unusual event included in this game, and the one with the best graphics, is the Equestrian event. The course you must ride is brilliantly defined, and the horses movement is a masterpiece of programming. High jump was my least favourite event, not through any lack of excellence but mainly because it's so damn difficult!!

Fencing, a sport I used to try to do myself, was one in which – prior to seeing Summer Games II – I doubted how well it would convert to micros, but as I should have known *Epyx have managed to capture both the action and the finesse of this underated sport.*

Both of the last two events, Cycling and Kayaking, are similar in one way: they require a lot of practice to perfect a successful method. As you can imagine, this is no real problem as this game makes it difficult to leave the keyboard anyway.



To call this game good must be the understatement of the year! If you want to buy a sports simulation game and you're still undecided on which, buy this one; it's absolutely superb!

Fast Loader: disk only.
Graphics: *****
Sound: *****
Playability: ****
CCI rating: *****
Price: £9.95.
Company: US Gold, Unit 10, Parkway Industrial Estate, Heneage Street, Birmingham, B7 4LY. Tel: 021-359 3020.

CCI

Games Arena

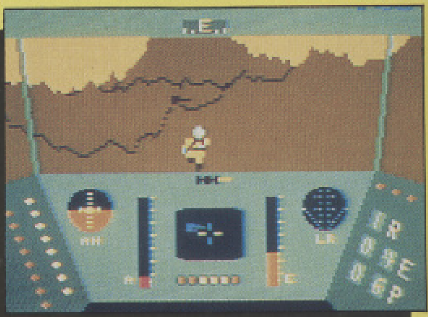
RESCUE ON FRACTULUS

Yet another US import, Rescue on Fractulus was created by Lucasfilms, the people behind Star Wars. It utilises a method of drawing called Fractal graphics. These create, supposedly, a more realistic three-dimensional effect by using the Fractal mathematical theories.

The game is basically a simulated space quest. You take on the role of a pilot of a now out-of-date spacecraft; your task is to rescue marooned space fighter pilots from Fractulus.

You start off with a statutory Star Warsesque leaving of the mothership, with the three dimensional effect being well done with a series of flashing colours. You are then put into the orbit of Fractulus.

Once there you must use the variety of scanners and instruments to locate your compatriots. On the lower of the 16 levels this is relatively simple – there are no flying saucers and relatively few laser buses firing at you. Once you have located a pilot you must lower yourself to an acceptable height from which you can then use the automatic landing computer to land. Having landed you must wait for the man to run towards your craft. This is very nicely displayed with an actual view of him running. He then knocks four times on your door instructing you to open the air-lock. This may sound very easy but, on the later levels you must distinguish from Aliens who, if you don't kill them, will punch through your windscreen (?? Ed.) and kill you.



This game is a departure for Activision from following trends to trying to lead them. Fractulus is a good game which gets better with you. The more you play, the more testing the game becomes.

I'll be playing it for quite a while I suspect; at least until Ballblazer comes out for the 64 (see games news).

Fast Loader: Flashload
Graphics: ****
Sound: ***
Playability: ****
CCI Rating: ****
Price: £9.99
Company: Activision, 15 Harley House, Marylebone Road, London NW1. Tel: 01-935 1428.

ROCKFORDS RIOT AND BOULDERDASH

Boulderdash was never the game with best graphics, neither did it have the greatest sound, but combined with good scrolling, great attention to detail and amazing addictability it became a top seller on every computer and for my part I loved it. With the advent of this tape I sincerely hope that at its bargain price all the non-converted will buy two of the most addictive and frustrating games ever.

In Boulderdash you play Rockford, a little being whose aim is to travel around a maze collecting jewels. Having collected enough jewels you can then travel through a magic door to the next level. The Boulders referred to in the name are lethal both to you and your enemies, although when you drop a boulder through certain walls they are turned into jewels.

Boulderdash II, known as Rockfords Riot in the UK, is for the more experienced amongst us. Although it is based on Boulderdash, and indeed is programmed by the same person, it carries the ideas and difficulties a long way further. I am always wary of sequels, as they tend to try and sell on their name, but Rockfords Riot is a truly enjoyable game in its own right.

If you own Boulderdash and are seeking a new and harder challenge, or if you have never played either, **this tape is an excellent pair of games at a realistic price.** Rockfords Riot deserves to be a success on it's own, but with Boulderdash also it should prove to be a chart topper.

Fast Loader: YES
Graphics: ***
Sound: ***
Playability: *****
CCI Rating: ****
Price: £9.95

Company: Monolith, 3rd Floor, Lector Court, 151 Farringdon Road, London EC1R 3AD. Tel: 01-837 2899.

THE GREAT AMERICAN CROSS COUNTRY ROAD RACE

"Why me?". That was the first thought that came to mind when I was handed this latest release from Activision. Not because it was Activision, a company whose games are generally very impressive, but because it was yet another racing car simulation.

Thankfully Activision have not just jumped on the bandwagon by producing the equivalent of a Pole Position 4, they have managed to add strategy and even a little education. The original idea behind The Great American Cross Country Road Race seems to me to have come from a famous Burt Reynolds film involving a race from one side of America to the other. Unfortunately you don't win $1,000,000 if you win the Activision version!

The game involves first choosing a course to race. This is very well done with a high-res drawing of the USA and a pointer showing the routes you could take to reach your required destination. There are four possible courses to choose from: Los Angeles to New York, Seattle to Miami, San Francisco to Washington and the US Tour. Having chosen the route you wish to take you are then shown the top 10 racers for that set course and the average speed they achieved over the whole course.

Having sorted all this out you can start racing in earnest. The display warns you of dangerous road conditions in advance so when you begin playing you are supposedly ready. The graphics are good, if not spectacular, and the game play is normal but surprisingly addictive. Sound is above average for this sort of racing game. The instrument panel is extremely comprehensive, showing all the usual clocks as well as a timer and a police radar warning (after all you are racing on a public highway with a speed limit of 55 mph!!). If you are speeding and a radar warning is flashed you can either slow down or try to out run them. If you are caught valuable time is wasted.

When you have raced each section your average speed is displayed as is your position in the field. **Overall this game adds a great deal to the average race game and therefore, in my view, it is worth recommending.**

Fast Loader: Flashload.
Graphics: ***
Sound: ***
Playability: ****
CCI Rating: ***
Price: £9.99 cassette.

Company: Activision UK Ltd, 15, Harley House, Marylebone Road, London NW1 5HE. Tel: 01-935 1428.

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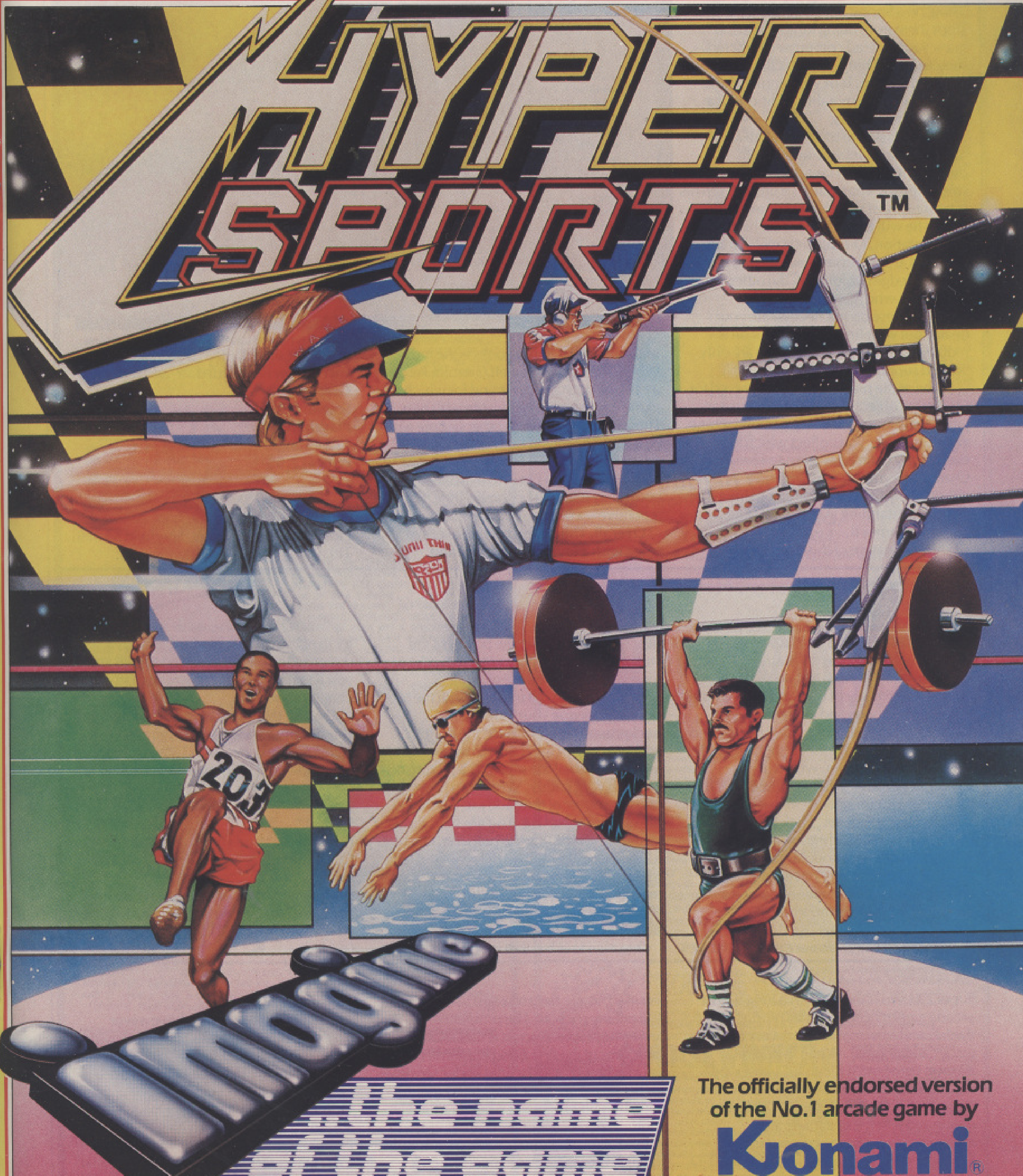
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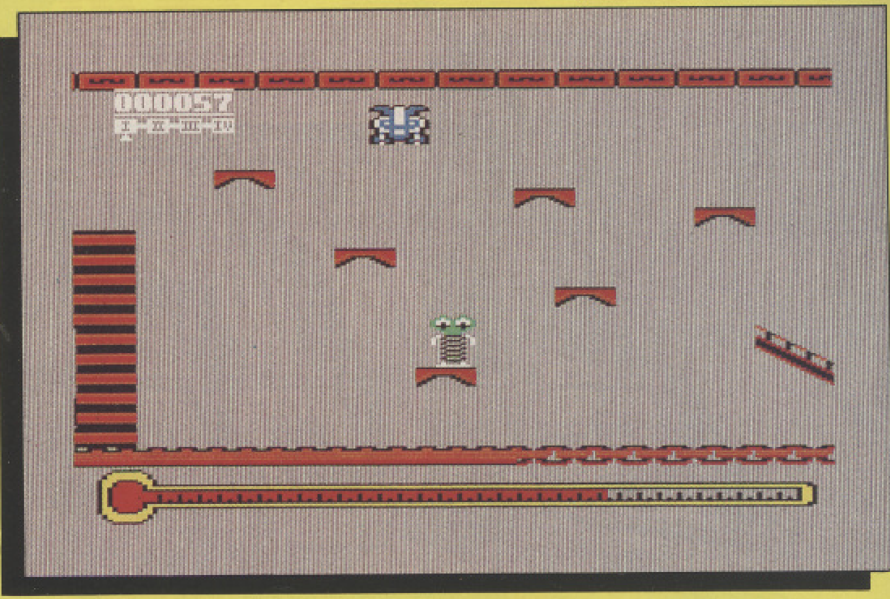
THING ON A SPRING



Thing on a Spring is the latest release from the company who rose to fame with the release of Monty Mole. Both Monty and Thing on a Spring have one thing which stops them from being forgotten in the graveyard of dead computer characters – they're cute! Thing, the affectionate name I adopted for him, looks uncannily like a 'Slinky', with the notable additions of a head and four limbs.

Thing's task is to travel through an 'underground fantasia' as Gremlin describe it, through fantasia is perhaps stretching the imagination a tiny bit. On his travels he must search for the 'armoury' where he will equip himself for his final confrontation. During his travels Thing bounces around from, you guessed it, ledge to ledge avoiding all the other characters who meander aimlessly around. These do not necessitate your death, but your limited supply of oil is reduced very quickly, and there are only limited supplies of extra oil.

Some of the nicest touches are saved for inanimate objects which you can use as ledges, my favourite being a fruit machine, and the objects you collect which are excellently defined as wrapped presents. Overall the graphics are very nice although, with the exception of Thing, they are not outstanding in this day of Elite and Summer Games II.

The one feature of this game which makes it a 'HIT' in my books is the music. When Tony Crowther left Gremlin I was afraid the outstanding sound for which his games were known would go with him, but Thing on a String shows other people can do it too! The tune is both catchy and well produced, using the fine 64 sound chip very well, though I'm sure that after a few hours play it would become a little repetitive – a fact the Editor will vouch for!!

Overall, Thing is just above average game with a lovable character and excellent sound.

Fast Loader: Novaload.
Graphics: ***
Sound: *****
Playability: ****
CCI Rating: ****
Price: £7.95

Company: Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS. Tel: 0742-753423.

NICK FALDO PLAYS THE OPEN

Timed to be released just after we have been subjected to over 40 hours of the Open on television, Argus were obviously hoping that the star of their program would produce the goods and give them some free advertising. Unfortunately he finished fifteen over par and thirteen shots behind the winner Sandy Lyle, who will undoubtably have a game named after him as the Open 'winner'.

As a game, however, Nick Faldo plays the Open is a relatively good and realistic simulation of a very popular participant sport. The game is very neatly packaged and includes full instructions as well as a history of the course and a hole by hole guide. The actual game uses Icons to choose the direction you are to hit the shot, the club you will use, the power of the stroke and also to show you an overhead view of the hole you are playing.

The screen is split into two with the top section showing your ball and the background scrolling past, the bottom section used for the Icons. In the centre of the lower half of the screen is a picture of you and your caddy. When you have chosen your shot the caddy will give you the club from his bag. You are then shown swinging and hitting the ball. It is here that a little more attention to detail would have made a big difference. The swing of your man is identical whatever club you use from a wedge to a driver, only when you putt does the swing shorten.

One nice touch is that if by chance you try to play a ridiculous shot, such as a driver off the green, your caddy will ask you if you're sure, and you can than change your club.

Overall this game is one of the best golf simulations I've seen, it has very nice scrolling and a few sound affects, but then again I haven't seen many!

Fast Loader: Yes
Graphics: ***
Sound: *
Playability: **
CCI Rating: ***
Price: £9.99
Company: Mind Games, Argus Press Software Ltd, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666.

SUPER ZAXXON

Super Zaxxon is the latest in a long line of arcade games licensed to be produced for the 64, and in many ways it is very true to the arcade original. When the original Zaxxon came out it received a deserved reputation as the game which made the most of a computers potential. This was continued when it first made an appearance on a home computer. Stunning perspective 3-D and realistic 3-D movement made it an immediate success.

Super Zaxxon is exactly what its name suggests. HesWare have taken all the good points from the original Zaxxon and improved them. The smooth scrolling is retained, as are the awkward force fields and enemy rockets. The problem in reviewing Super Zaxxon is that all the criticisms of the first Zaxxon are still there; the movement is still a little under sensitive for my liking, making sharp movements very difficult to execute when in a tight spot.

One of the more noticeable additions is towards the end of each round when a fire-breathing dragon attacks. The only way of killing it is by firing repeatedly and accurately at it. Once it is successfully killed you receive a large bonus and immediately move on to the next (and more difficult level).

For all the people who have never owned Zaxxon then this is worth buying. If you happen to have the original Zaxxon the decision will be more difficult.

Fast Loader: YES
Graphics: ****
Sound: ****
Playability: ***
CCI rating: ****
Price: £9.95 (tape) £14.95 (disk).

Company: US Gold Ltd, Unit 10, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.

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This month your letters are answered by Rae West. Rae is the author of three large reference books on Commodore computers; the latest is Programming the Commodore 64, following Programming the VIC and Programming the PET?CBM. All are published in the UK by Level Ltd. Rae is also published in the USA by Compute! Books.

Dear Rae

'I would like to know what happens when, using a motherboard, RAM and ROM try to fill the same location. I'm planning on obtaining a second 16K RAM pack to expand my VIC-20 fully, and want to use the machine-code monitor VICMON. I would like to know what happens in case I damage something,.

Mr Idle, London.

I've done this sort of thing myself, and, while a memory conflict like this never gave me any damage problems, neither RAM nor ROM will work reliably. A full answer to your question would take a lot of room; the following page numbers refer to my book 'Programming the VIC', which gives full information:

To use your extra memory effectively, you could (i) Load VICMOM into RAM at the usual $6000-$6FFF (p.256); (ii) Turn off 8K of your new 16K RAM (diagram p.120) and use along with VICMOM in ROM; or (iii) Relocate VICMOM in RAM, perhaps to $A000, to get it clear of BASIC (p.255).

Incidentally, VIC-20 isn't quite 'fully' expanded, even with two 16K RAM packs (pages 109 on); there are still some areas without RAM or ROM.

Dear Rae

'We wish to connect a Plus/4 with an Epson FX-80 (which is Centronics compatible), Commodore sent us an RS232 unit which we returned. Can you advise us?'

J Street, Shoreham.

A RS232 unit is of course unsuitable.

A serial port adapter for the 64 (ie a connecting cable, round at the Plus/4 end, Centronics at the other) should work with the Plus/4, since both operate with Commodore printers and disks. This might be your best bet.

The Plus/4 (unlike the C16) has a user port, which, though not itself Centronics compatible, could be used to drive a Centronics printer. This requires software (to intercept the PRINT command) as well as hardware, and such software wouldn't work eg on the 64. Because of the Plus/4's relative unpopularity, it may be hard to find a company with the necessary software and cable for a user-port interface.

Unfortunately, I haven't experimented enough with the Plus/4 to be able to recommend a specific product.

Dear Rae

'I have acquired a colour monitor from an old arcade machine. It has a five-line RGB input (red, green, blue, horizontal and vertical syncs). Can I use this with my 64?'

M Dodd, Newscastle upon Tyne.

VIC-II (in the 64) produces composite video output. I have it on good authority that it is virtually impossible to convert this output into separate colour signals. The PAL system (used in UK televisions) uses phase, contained in a 4.33 MHz carrier, to code colour, and this changes too fast relative to the 64's dot clock. It's not even particularly easy to use your RGB monitor in black and white. You may find it usable with a C128, though you won't have the intensity control!

Dear Rae

I am the owner of a 1541 disk drive and in common with a few of my friends have experienced problems with the drive going out of alignment. I have access to an oscilloscope and a multimeter. How do I realign a 1541?

M J Roberts, Chelmsford

You'll also need a specially-recorded alignment disk and software which controls the drive without reference to the diskette — ie which controls the head directly. Alignment disks tend to be expensive, since they are specially recorded by non-standard methods. There's a relatively cheap commercial package available, which includes a test disk with sectors deliberately staggered and instructions. Also ICPUG (the Independent Commodore Products User Group) can advise you on this: phone Membership Secretary Jack Cohen on (01) 590-8849.

Dear Rae

I have tried writing a simple graphic adventure. Straight away I was hit in the face by the problem of how to split screen modes. The Reference Guide explains the secret is to use VIC-II registers 25 and 26 but it doesn't give a program. I have tried hundreds of times yet without success. Please help me with this problem and please explain these registers'

G Pollitt, Bolton.

And a similar letter;

I would like to know how to split the screen into two parts of equal size. I would like both to hold text. Please could you print a program . . .'

M Swash, Brentwood.

This is difficult: I'm not surprised you've had problems. My book 'Programming the Commodore 64' details this, and its disk has a demo program; also I intend to do a full article in CCI answering these specific questions, but meanwhile these notes are all I have space for:

Interrupts (IRQ type) can be processed by poking 788 and 789, with for example 0 and 192 to point to 49152; in this case, machine language starting at 49152 executes with every interrupt. This block of ML normally ends with JMP EA31 to complete the interrupt satisfactorily.

Ordinary interrupts (the ones that update the clock, TI) can be turned off, eg with POKE 53274,129, and the screen scan made to generate IRQ interrupts in its place by poking 1 into 53273 — your "Register 26". This must be done at every interrupt or the flag will clear and interrupts will cease, locking out the keyboard.

Location 53267 sets the raster line at which an interrupt is forced. The VIC-II chip signals an interrupt when it starts processing TV output at this specific line of the TV, so such interrupts are exactly synchronised with the picture. Often, the interrupt processing routine checks this register to see whether the chip is currently writing to the top or bottom of the TV screen.

The screen-memory start position is determined by the contents of 56576 (selects VIC-II bank), 53272 (start of character memory), and 648 (makes BASIC work properly). These locations are essential when splitting output between two independent screens; typically, a screen split in two halves changes these parameters twice in each full scan of the screen.

Finally, location 53265 controls whether bitmapping is on or off; this is needed with graphics plus text adventure, but not with text screens.

Dear Rae

I was downloading an 8K sequential disk file of data from my Commodore 64 to a BBC B. My C64 program stated 8K bytes were sent, but the BBC only received 7962 bytes. I understand that trouble can result when receiving from RS232 to disk on a 64. Is this also the case in send mode?

B J Garrett, Luton.

Yes. Disk activity and the RS232 aren't properly compatible. Your best bet is to read the disk file first, storing the data in RAM memory, then PEEKing these values back, using PRINT£ to send over the RS232, without using the disk. For example you could put 4K into the RAM between 49152-53248, send this, then repeat.

Do you have a computing problem, or advice to offer other readers? Write to us at:

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Mega-Review

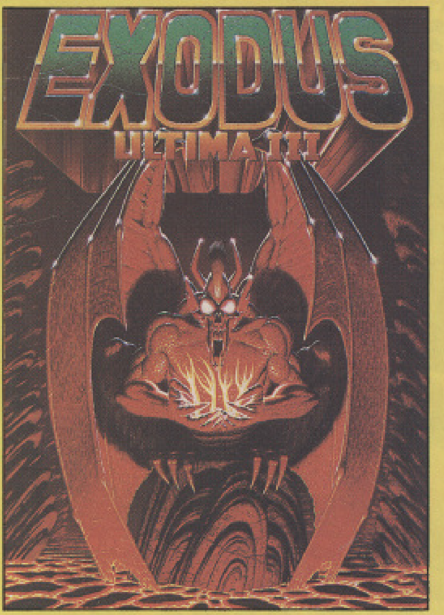
EXODUS: ULTIMA III

This game is a new title from that branch of US Gold called "All American Adventures Ltd". The program is only available on disk at a price of £19.95. As its name implies it is the third in a series of adventure games under the same title; US Gold has imported it from the American software house "Origin Systems".

Not being privy to Ultima I & II, I started off at a disadvantage in understanding the complexities of Ultima III, and believe me it is incredibly complex! There are frequent references to your previous experiences in the magical world of SOSARIA but these must be taken as they are intended, as an attempt at providing the player with 'atmosphere'.

The game is not just RUN and then played, it is a role playing game; so, just like real life, you must equip your expedition – which means planning for the conditions you might encounter and making a scenario disc containing your preparations.

Having created at least four members to make up a party you are ready to enter the game proper. The screen display is much the same as any other adventure with text and graphics, the left-hand two thirds contains the map/picture display which scrolls in four directions; the right third contains the status display showing updated information on your four party members – these figures will change throughout the game, reflecting injury, the acquisition of treasure and so on.



Below the status display is the command entry area; there are a wide variety of commands – one for every letter of the alphabet.

When you enter SOSARIA your party will be set down a few moves away from a town, you should go there immediately to buy equipment for your expedition and if you wish you can have a chat with the ruler of the place "LORD BRITISH". At first he hasn't much to say but if you become heroes perhaps he will be kinder to you! Outside the city walls you only have your weapons, intelligence and magical abilities to protect you and your objective is to tackle evil creatures – it is not easy but once you meet an enemy the screen changes to a tactical picture with the positions of your party and the enemy indicated.

If you win the battle you return to the strategic map, if you don't the whole program must be re-loaded and run. This is a failing which annoyed me, particularly when learning the program.

EXODUS: Ultima III is a big program demanding more than the usual devotion from the player. It will appeal to dedicated adventure gamers but may prove daunting for anyone thinking of having a go for the first time.

Fastloader: Disk only (quite slow)
Graphics: ****
Sound: ***
Playability: ***
CCI Rating: ****
Price: £19.95 (disk only)
Company: All American Adventures Ltd, Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham. Tel: 021-359 3020.

Michael Fopp

CRUSADE IN EUROPE

US Gold has imported another of the strategy games from that excellent company MicroProse. Crusade in Europe is new and gives you the chance of being General Eisenhower as Supereme Allied Commander; as the game booklet puts it, "YOU are in Command – D-Day to the Battle of the Bulge!!".

This is very much a computer wargame in the traditions of all others, but not really anything particularly special except that it is really five games in one. Normandy (the invasion), the Race for the Rhine, Operation Market Garden (Arnhem), the Battle of the Bulge and Crusade in France (June to October 1944) are all included making the program incredible value for money.

A menu of options allows you to determine which 'battle' you wish to fight and, upon selection, the usual map display is shown with the disposition of both your forces, and those of the enemy that are available to you through your intelligence services. Movement of troops etc is either by joystick or keyboard and commands are entered after a box-like cursor is placed over the unit to which you wish to talk. You may use your forces to 'attack', 'move', 'defend' or 'reserve' – these are termed "action commands", there are a whole series of other commands which are clearly described in the 56 page booklet that accompanies the program.

In terms of its similarity to other wargames I must say that is no worse than some of the best but has no really innovative features. It lacks the arcade feature element that can appeal to non-wargamers; however, if you are thinking of taking up this side of computing, CRUSADE IN EUROPE is an excellent first buy. Whilst being complex and pretty accurate historically, it also provides options for the beginner. Normally wargames have an informative, but rather difficult to understand, system of marking respective units of Infantry, Armour, Artillery etc. With this game you have the option of having either these dedicated markings or you can choose to use symbols which graphically show what type of unit you are commanding. The symbols are not capable of giving as much information as the usual wargaming marks but they are easier for the novice to understand.

CLUE: In what year was the 1066 invasion?

The sound is very good and the changes of colour work well; the ability to look at the whole battlefield quickly, and to scroll about the tactical area is a feature applied to good use in this game. One little moan – there are some slight inaccuracies in the accompanying booklet, for instance a map shows German occupied territory as at 5 June 1944; this map assumes that Sweden, Finland and Switzerland were occupied which, of course, was not so.

CRUSADE in EUROPE is yet another strategic simulation offering little innovation but **really excellent value for money, coupled with clever use of graphics, sound and screen scrolling.** If you have been thinking about starting to play wargames this is a good one with which to start.

Fastloader: Disk only
Graphics: ***
Sound: ****
Playability: ***
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Database, for example, is a brand new, cartridge and disc based software package. Especially designed for both, first time and experienced data base users.

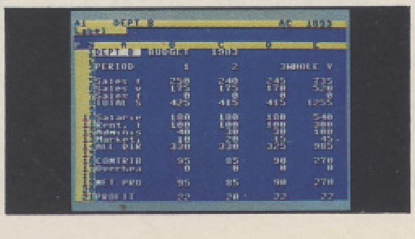
For those of you who need to collate and store information for easy recall, data base can make life easier. The basic package includes a mailing list and 4 different print programs.

NEW
handic data base
handic data base

CALC RESULT

Calc Result, the financial spreadsheet for the 64, that's ideal for all those domestic headaches, such as loans, mortgages, home budgeting, stock portfolios, tax planning – let alone all those bills! In the office too Calc Result will make calculating, budgeting, simulation, construction so much easier for the business – large or small. This easy to learn package comes in two versions – Calc Result easy (cartridge based) and Advanced (disc and catridge based with pedagogical manual).

Calc Result
Calc Result
handic



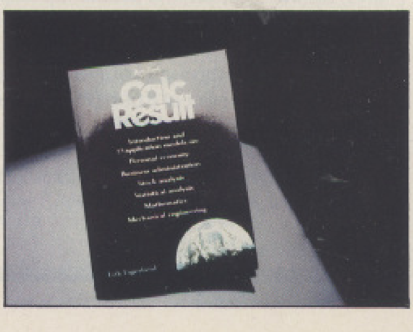
TECHNICAL DATA

- **Spread sheet size**
  64 X 254 X 32 pages
- **Consolidation:** Easy with the 32 pages available in Calc Result Advanced
- **Printing:** Flexible printing formats out to most popular printers
- **Graph:** Histogram with scroll through feature rows and columns for printing
- **Colour:** Supports full colour down to individual cell level
- **Help:** Easy help screens available, at all levels
- Calc Result is also available in eight European languages

Applied Calc Result describes a larger number of applications in the area of:–

PERSONAL AND BUSINESS FINANCE · STOCKS AND SHARES · STATISTICS · MATHEMATICS ·

The user of Calc Result will find among the applications given many useful examples of how to get the most from Calc Result.


Calc Result

THE Handic supermarket basket is full of 'goodies' for your Commodore 64. Here is a brief description of what they all are! Don't forget – if you need any more information, either clip the coupon (and tick column 'A') or give us a ring.

1 Mon 64
An outstanding Machine Code Monitor (cartridge based)

2 Teledata
Communication cartridge for use with the CBM 64, link up with Databases like the bank or supermarket, over the telephone lines.

3 Superbox 64
An expansion unit for the Commodore, which features three independant cartridge slots; IEEE interface that is totally transparent; has multi-user capabilities with IEEE; and a re-set switch which activates a cold start on the computer. This unit will connect up to 3 cartridges at the same time, which makes frequent altering between programs simple and reduces wear on the cartridge slot.

4 Vic Rel
Vic Rel (Rel 64) is a relay cartridge for the CBM 64 and Vic 20 which has almost limitless applications, such as control of burglar alarms, garage doors, door locks, electric radiators, lamps , transmitters, model railways, etc.etc.

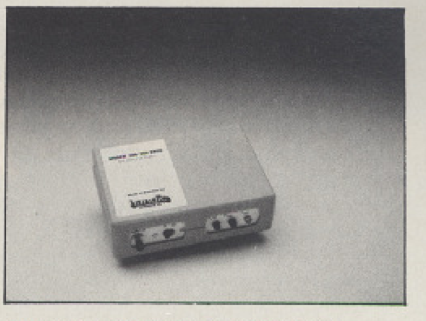
5 Disc-based games
Handic have a set of disc based games for the Commodore 64, all are great fun and superb colour graphics. At around 9.95 each. Why not treat yourself to a few?
Quantity discounts are available on request – dealer enquiries are also welcome.

6 Diary 64
An ideal program for keeping track of telphone numbers, addresses, appointments, schedules, in fact the ideal time manager for all you sieve-heads.

7 Stat 64
The statistical CBM cartridge which ads 19 new commands to your Basic language. An excellent programming aid for all you statisticians.

8 Graf 64
A CBM cartridge that turns solutions of equations into graphical analysis, what you might call a plotter-jotter.

9 Handic Auto Modem
This modem is the expanded version of the Videotex modem (see illustration). When used together with the Handic Teledata Base 64 this unit enables you to set up your own data base with information.



Videotex Split-Speed Modem
This Split-Speed modem is especially designed to connect with computers over the telephone lines, its facilities include auto-dialling, line control, etc. (BT approval applied for).

10 RS232
A standard V.24 (RS232) interface for connecting the CBM 64 to printers and other peripherals.

11 Bridge 64
A cartridge bridge game for the intelligentsia.

12 Forth 64
A Forth generation programming language for people who know what they are talking about, and want to know even more.

MON 64
DIARY
BRIDGE 64
1
2
3
4
5
6
7
8
9
10
11
12

Checklist

		A	B
COMMODORE 64–SOFTWARE			
CALC RESULT ADVANCED	99.00	☐	☐
CALC RESULT EASY	49.95	☐	☐
DIARY 64	19.95	☐	☐
BRIDGE 64	19.95	☐	☐
STAT 64	29.95	☐	☐
REL 64	34.95	☐	☐
MON 64	39.95	☐	☐
GRAF 64	29.95	☐	☐
FORTH 64	34.95	☐	☐
SSP (DISK BASED DIARY)	12.95	☐	☐
DISK BASED GAMES			
SPACE ACTION	9.95	☐	☐
SPACE TRAP	9.95	☐	☐
OISAC	9.95	☐	☐
Q-HOP	9.95	☐	☐
THE SHIP	9.95	☐	☐
MUTANT SPIDERS	9.95	☐	☐
FOURTH SARCOPHAGUS	9.95	☐	☐
STELLAR CONFLICT	12.95	☐	☐
IMAGINATION	12.95	☐	☐
REAL ESTATE	12.95	☐	☐
COMMODORE 64–HARDWARE			
VIC SWITCH	97.75	☐	☐
3M CABLE	4.95	☐	☐
6M CABLE	7.94	☐	☐
12M CABLE	9.89	☐	☐
SUPER BOX	67.87	☐	☐
RS232 INTERFACE	39.42	☐	☐
RESET SWITCH	5.98	☐	☐
APPLIED CALC RESULT	14.95	☐	☐
NEW HANDIC DATA BASE	**62.00**	☐	☐
IBM & COMPATIBLES			
CALC RESULT	316.25	☐	☐
WORD RESULT	316.25	☐	☐
CALC & WORD RESULT	534.75	☐	☐

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POSTAGE AND PACKING F.O.C.

		A	B
SOFTWARE & HARDWARE FOR THE COMMODORE 8000/700			
CALC RESULT 8000	228.85	☐	☐
CALC RESULT 700 SERIES	258.75	☐	☐
WORD RESULT 700 SERIES	258.75	☐	☐
HARDWARE			
PET SWTICH MOTHER UNIT	172.50	☐	☐
DAUGHTER UNITS			
–SK/05/8295 1.5 mtr	112.70	☐	☐
–SK/05/8296 3.0 mtr	112.70	☐	☐
–SK/05/8296 7.5 mtr	112.70	☐	☐
–700 SERIES incl. ADAPTOR	126.74	☐	☐

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Tick column A for more information and column B for order.

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FRANKIE GOES TO HOLLYWOOD

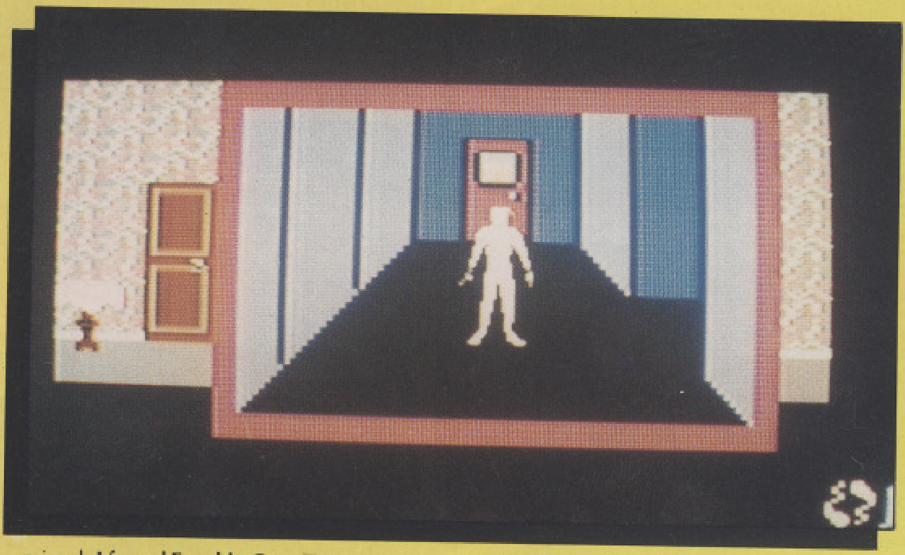
The band, Frankie Goes To Hollywood, shot straight to the top of the charts and this game looks set to follow the same path.

There is much more to this game than first meets the eye. You start the game outside a terrace of houses. Entering houses at your will leads you into a variety of rooms. Touch everything, via joystick movement, and the story unfolds.

You discover objects – some essential, some useless. Be selective as you can only carry eight objects which can't be dropped and collected later – only used, preferably in the right situations.

The aim is to become 100% a real person, find the computer terminal in the pleasure dome and stop a nuclear attack. On the way there are opportunities to prove yourself in arcade battles. A word of advice here – when you insert a video, walk into the display!

If that's not enough to hold your interest, there is also a whodunnit murder mystery to be solved with various clues flashing up as you enter different locations.



Although feelings in the office were mixed, **I found Frankie Goes To Hollywood extremely addictive and felt it to be an excellent blend of adventure and arcade action mixed with a touch of mystery.**

The graphics, while not stunning, are good and the accompanying soundtrack of music from Frankie is very well done.

I'll be addicted for some time yet.

Fast Loader: Yes
Graphics: ****
Sound: ****
Playability: ****
CCI Rating: *****
Price: £9.95
Company: Ocean Software, Ocean House, 6 Central Street, Manchester M2 5NS. Tel: 061-832 6633.

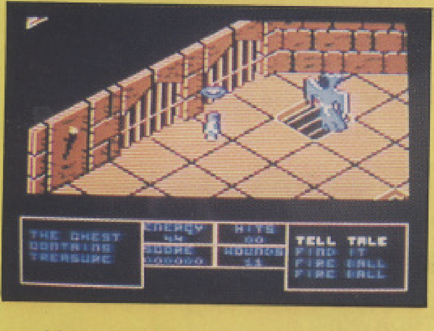
COMING SOON

WIZARDRY

Having seen all the advertising I set my heart on seeing Wizardry in time to get a sneak preview for this months issue, and as you can see I just made it! I must thank Tim and Sheri Langdell for being so helpful.

Wizardry can, in the truest sense of the phrase, be described as a graphical adventure. Written by Steven Chapman, author of "Quo Vadis", it uses Dungeons and Dragons base to make the game require thought as well as dexterity.

The opening scene shows you, a small but well defined little character, in a three dimensional diagonally scrolling maze. The aim of the play is to travel about the maze collecting and using as many spells as possible to aid your ultimate task, to attack and destroy the 'Elemental'.



Although still in a pre-production state the games graphics and music seemed truly outstanding, with the music giving vital clues to the level of danger in a room.

To aid your quest you have a choice of spells such as 'fireball', 'tell-tale', and 'hold'. Each of these will help you against certain enemies; the 'tell-tale' being especially useful to reveal hidden treasure chests which can reveal either extra spells, or a deadly cloud of gas.

As well as adventuring you can use your Decathlon skills by fighting with a sword which demands real joystick snapping antics!

The castle has 75 locations each covering a large scrolling area, and I cannot see anyone completing it for quite a while! Thankfully it looks as if a beginners crib sheet will be included for the first level, which should avail the game to people who would otherwise find it difficult to get stuck in to.

Wizardry is a game which in my view deserves to push 'The Edge' to a status amongst software houses which at the moment is dominated almost completely by U.S. groups, it's truly superb!

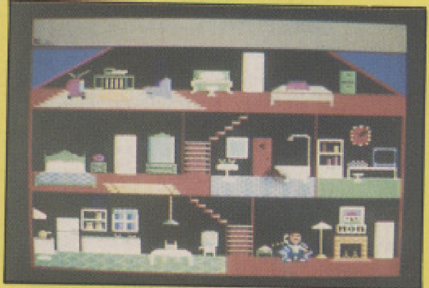
Contact: The Edge, 12-13 Henrietta Street, Covent Garden, London WC2 8LH. Tel: 01-240 1422.

FKJ

Activision has recently announced that David Crane, author of Pitfall and Ghostbusters, is nearing completion of his new program. Called Somebody's in my Computer it's not a game but more a pet-like friend to occupy your computer.

Although not the world's best kept secret, what I have seen of the program suggests that it is likely to be one of the most innovational programs for a home micro for a long time. The graphics and sound are both excellent, and perhaps the cleverest feature is that each program will produce a character individual to each 'owner'.

I wait in anticipation of a completed version (are the powers that be listening??) which should mark the continued rise of Activision to a power to be reckoned with.



Also soon to be released for the 64 by Activision is Ballblazer. Said to have some of the best sound ever for the 64, although having not heard the 64 version I can only say that if it is similar to the Atari's, it's worth waiting for. The graphics are truly excellent on one of my favourite games.

F.K.J.

Don't Buy another tape...

(OR DISK!)

REVIEWS ★ REVIEWS ★ REVIEWS
IMPOSSIBLE MISSION
ROCKET
SPY HUNTER
THE DAM BUSTERS
Front View

Mr. Software

COMMODORE CLUB

BRITAIN'S No.1 SOFTWARE CLUB

Volume 1, Issue 2

3rd July 1985

FREE GAMES!

Yes — we're giving away free games — like the fabulous Kik Start from *Mastertronic* (given a rave review in the July issue of Zap!) and Finders Keepers which has been a smash hit on the Spectrum and was only released on the Commodore 64 on 29th June. To qualify for a free game all you have to do is place an order with a total value (before postage) of £12. You can then add one of the games shown above to your order as usual but simply write 'free' in the price column and leave it off your payment total. The offer closes on 30th August 1985 for UK members and 30th September for all overseas members.

ELITE

Description
Probably the best-selling game on the BBC, now available for the Commodore 64, Elite is described as "a fantastic voyage of discovery and adventure" by Firebird.

Storyline
You are in command of a Cobra spaceship, and all you have is 100 credits, seven lightyears of fuel and a laser to defend yourself with. The object of the game is to accumulate as much money and equipment as you can — in the shortest possible time. To do this you have to trade between "countless" planets. This involves interplanetary and intergallactic space travel, and as you amass your fortune on these journeys you will also build up a large number of enemies. Local police will be after you if you are involved in black market trading. When the game starts you are given the status of harmless, but as you get more experienced, and richer, there will be a price on your head, so there will be bounty hunters to contend with. Then, as your wealth becomes larger and more well known, pirate vessels will start to come after you. There are also space-hermits and the deadly enemy of any humans — the Thargoids.

The Game
Essentially, as a space trader you have to learn how to survive in space, find the planets that are safe and those that are not, and boost your cargo and space rating as high as possible. The game begins with your ship equipped

INSIDE THIS ISSUE

- ★ TOP TEN
- ★ REVIEWER'S CHOICE
- ★ WHAT THE PAPERS SAY
- ★ SHADOWFIRE
- ★ GAME TIPS
- ★ BUMPER ISSUE

...Until you've seen the low, low prices in our Commodore Club magazine. Light up your bank manager's face by getting **Shadowfire** for just **£5.95** (saving £4), steal yourself a bargain with **Spyhunter** at only **£4.95** or join the priveleged by buying **Elite** at **£11.50** instead of £14.95. What's more, if you get an order in before the end of August you can claim a **FREE GAME**. Yes, place an order worth £12 or more and you can take *Mastertronic's* **Kik Start** (which was given a rave review in the July issue of *Zap!*), or the Spectrum game **Finders Keepers** — recently released on the Commodore 64 — at no extra cost.

So what's the catch, we hear you say? How many tapes must I commit to buy? The answer is **none**. If you become a subscriber to our magazine (which is available only by post) then we enrol you as a member of our software club at no extra cost. It's then up to you whether you buy anything or not. There are no minimum purchase requirements.

The magazine is published six times a year and is packed with product reviews (including lots of screen photos) game playing tips, competitions to enter and more. Hurry now — if you take out a subscription within the next four weeks we'll give you a £1 voucher towards your first purchase through the Club.

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Printer Utilities

This two-part article by Gerry Kennedy presents some useful machine code routines for clearing and moving the contents of large areas of memory, and for dumping screen text by program to either a serial printer on the serial bus, or (next month) to a parallel printer via the user port.

One great problem with the 6500 series of microprocessors is 8-bit indexing which, at first sight, makes the task of clearing large chunks of memory rather daunting – beyond zero page, that is. The answer does not lie in the soil, but in Indirect Indexed Addressing, which has the form LDA ($5E), Y where the instruction means "load the accumulator with the y'th entry of a table whose base address is held in $5E (low order byte) and $5F (high order byte), and where 'y' is the value held in the Y index register" (the offset from the base address). It should be noted that this instruction can only be used with the Y and not the X index register.

One tiny problem with indirect indexed addressing on the Commodore 64 is that the base address can only be held in two consecutive bytes in zero page – that is, in memory locations whose addresses do not exceed 8 bits ($00 to $FF inclusive). Nearly all of page zero is allocated as the system work area, but there are a few unused or temporary memory bytes available which can be used for indirect indexed addressing.

The addresses are:

```
        $02
        $35,$36
        $97
        $A3,$A4
        $D7
   and  $FB,$FC,$FD,$FE & $FF
```

There are two main methods of placing zero's (or any other character) through large sections of memory, each having advantages and disadvantages, depending on the job in hand.

The simplest method is to index $FF locations and start afresh with a new base address.

For example, to clear memory from 2000 to 25FF, placing the program to do this at $C000 (above BASIC) and using $FB and $FC for the indirection base address we could have:–

```
C000   A0 00   LDY #$00
C002   A9 20   LDA #$20
C004   85 FC   STA $FC
C006   A9 00   LDA #$00
C008   85 FB   STA $FB
C00A   91 FB   STA ($FB),Y
C00C   C8      INY
C00D   D0 FB   BNE $C00A
C00F   E6 FC   INC $FC
C011   A5 FC   LDA $FC
C013   C9 26   CMP #$26
C015   D0 EF   BNE $C006
C017   00      BRK
```

Here the base address of $2000 is placed in the zero page locations $FB (low order byte, $00) and $FC (high order byte, $20) and the accumulator is set to zero, the value to be placed through memory. At C00A a loop is started whereby the accumulator contents ($00) is stored in the base address, the next location and so on until the Y index register has incremented from $00 through $FF and back to $00. At C00F the high order byte is incremented so that a fresh base address is produced, namely $2100. The process loops back to continue the process until at C013 a test is carried out to see whether $2600 has been reached, that is, one location beyond the target location of $25FF.

In the last line $C017 a 'break' instruction is shown. In a practical use of the program this would be replaced by RTS if the program was to be called as a subroutine in assembler, or from BASIC via a SYS call. Alternatively, the routine might jump to another program or continue as part of a larger set of instructions.

The advantage of this simple routine is that only the A and Y registers are used, but it is only really suitable for whole sections of memory $FF bytes long.

A second more comprehensive method is to specify the block size ($FF in the above example), the number of blocks and to make provision for any remainder at the end of the main routine which has to be cleared and which is less than the standard block size.

This time we shall clear from $2000 to $802C and again place the program at $C000. The block size will be chosen to be as large as possible within 8 bits, for efficiency (from $00 to $FF). Thus $60 blocks will be required to clear from $2000 to $7FFF inclusive. The program is so arranged that the remainder is inserted as the MS byte of the target end address: here this last location is $802C and hence the remainder is inserted as $2C.

```
C000 A9 00   LDA #$00      base address, low byte

C002 85 FB   STA $FB       indirection address, lo

C004 A9 20   LDA #$20      base address, high byte

C006 85 FC   STA $FC       indirection address, hi

C008 A2 60   LDX #$60      number of blocks

C00A A0 00   LDY #$00      block size $100 ($00 - $FF)

C00C A9 00   LDA #$00      memory fill character

C00E 91 FB   STA ($FB),Y store memory fill character

C010 88      DEY           decrement memory pointer

C011 D0 FB   BNE $C00E     continue only if $100 bytes done

C013 E6 FC   INC $FC       point to next block

C015 CA      DEX           count down blocks

C016 30 06   BMI $C01E     check for last block

C018 D0 F4   BNE $C00E     continue only if Y=0

C01A A0 2C   LDY #$2C      load remainder

C01C D0 F0   BNE $C00E     loop again

C01E 00      BRK           end (or RTS)
```

One point worth noting – when playing with memory clearing or pre-loading for test purposes, make sure that the area selected is RAM and not ROM: $A000 to $BFFF and $D000 to $FFF are ROM. Problems may also be encountered in altering memory between the middle $9000s and $9FFF. The safest areas, which over-write BASIC (recoverable on next start up) are workspace from $2000 to $9000 with $C000 to $CFFF as convenient for programs and subroutines.

DUMPING SCREEN TEXT TO A SERIAL PRINTER

The Commodore 64 has a serial bus accessible via a 6 pin DIN connector on the rear panel. The program for the parallel printer was re-written to control a standard serial Commodore MPS-801 printer. Since the Kernal firmware in the 64 is already designed to control the serial bus, the relevant routines were picked out, and the previous subroutine for sending an ASCII character to the printer re-written. The CIA configuration section was deleted, as were some of the delays. The final program is shown below, starting at $C000 so that it can co-reside with the parallel printer program.

```
C000 A0 00 LDY #$00
C002 A9 00 LDA #$00
C004 85 FB STA $FB     Reset counters
C006 85 FD STA $FD     and pointer.
C008 85 FE STA $FE     Set up screen
C00A A9 04 LDA #$04    base address
C00C 85 FC STA $FC

C00E 20 DE C0 JSR $CODE    Fetch character
C011 4C 68 D0 JMP $C068    Test line
C014 A0 00    LDY #$00     Reset pointer

C016 E6 FE INC $FE
C018 A5 FE LDA $FE
C01A C9 01 CMP #$01
C01C F0 0C BEQ $C02A
C01E C9 02 CMP #$02
C020 F0 12 BEQ $C034   Test for block number
C022 C9 03 CMP #$03
C024 F0 1A BEQ $C040
C026 C9 04 CMP #$04
C028 F0 22 BEQ $C04C

C02A A9 F0    LDA #$F0
C02C 85 FB    STA $FB      Set up 2nd
C02E 20 8C C0 JSR $C08C    block
C031 4C 0E C0 JMP $C00E

C034 E6 FC    INC $FC
C036 A9 E0    LDA #$E0     Set up 3rd
C038 85 FB    STA $FB      block
C03A 20 8C C0 JSR $C08C
C03D 4C 0E C0 JMP $C00E

C040 E6 FC    INC $FC
C042 A9 D0    LDA #$D0     Set up 4th
C044 85 FB    STA $FB      block
C046 20 8C C0 JSR $C08C
C049 4C 0E C0 JMP $C00E

C04C E6 FC    INC $FC
C04E A9 C0    LDA #$C0
C050 85 FB    STA $FB
C052 20 8C C0 JSR $C08C
C055 20 DE C0 JSR $CODE    Set up last
C058 C0 28    CPY #$28     block
C05A D0 F9    BNE $C055    and exit
C05C 20 8C C0 JSR $C08C
C05F 20 8C C0 JSR $C08C
C062 A9 01    LDA #$01
C064 20 C3 FF JSR $FFC3
C067 00       BRK          (Or RTS)

C068 C0 28    CPY #$28
C06A F0 1A    BEQ $C086
C06C C0 50    CPY #$50
C06E F0 16    BEQ $C086
C070 C0 78    CPY #$78
C072 F0 12    BEQ $C086    Subroutine
C074 C0 A0    CPY #$A0     Test for
C076 F0 0E    BEQ $C086    1 of 6
C078 C0 C8    CPY #$C8     lines per
C07A F0 0A    BEQ $C086    block
C07C C0 F0    CPY #$F0
C07E F0 03    BEQ $C083
C080 4C 0E C0 JMP $C00E
C083 4C 14 C0 JMP $C014
C086 20 8C C0 JSR $C08C
C089 4C 0E C0 JMP $C00E
```

```
C08C 20 D8 C0  JSR $C0D8
C08F A9 01     LDA #$01     Subroutine
C091 8D EB C0  STA $C0EB    Carr Retn with
C094 20 BE C0  JSR $C0BE    delay
C097 60        RTS

C098 8D EC C0  STA $C0EC
C09B 8A        TXA
C09C 48        PHA
C09D 98        TYA
C09E 48        PHA
C09F A9 01     LDA #$01
C0A1 A2 04     LDX #$04
C0A3 A0 FF     LDY #$FF     Subroutine
C0A5 20 BA FF  JSR $FFBA    Send ASCII
C0A8 20 C0 FF  JSR $FFC0    character to
C0AB A2 01     LDX #$01     Serial Bus
C0AD 20 C9 FF  JSR $FFC9    printer
C0B0 AD EC C0  LDA $C0EC
C0B3 20 D2 FF  JSR $FFD2
C0B6 20 CC FF  JSR $FFCC
C0B9 68        PLA
C0BA A8        TAY
C0BB 68        PLA
C0BC AA        TAX
C0BD 60        RTS

C0BE A9 00     LDA #$00
C0C0 A2 00     LDX #$00
C0C2 8D ED C0  STA $C0ED
C0C5 AD ED C0  LDA $C0ED
C0C8 69 01     ADC #$01
C0CA 8D ED C0  STA $C0ED    Subroutine
C0CD C9 01     CMP #$01     Delay
C0CF D0 F4     BNE $C0C5
C0D1 E8        INX
C0D2 EC EB C0  CPX $C0EB
C0D5 D0 EE     BNE $C0C5
C0D7 60        RTS
```

```
C0D8 A9 0D     LDA #$0D
C0DA 20 98 C0  JSR $C098    Subroutine
C0DD 60        RTS          Carr Return

C0DE B1 FB     LDA ($FB),Y
C0E0 C9 1B     CMP #$1B     Subroutine
C0E2 B0 02     BCS $C0E6    Fetch screen
C0E4 09 40     ORA #$40     char & convert
C0E6 20 98 C0  JSR $C098    to ASCII
C0E9 C8        INY
C0EA 60        RTS

C0EB -         -            Temporary
C0EC -         -            storage
C0ED -         -            locations
```

In the subroutine $C098 to $C0BD the following Kernal routines are called in the following order:

$FFBA SETLFS Set up a logical file
$FFC0 OPEN Open a logical file
$FFC9 CHKOUT Open a channel for output
$FFD2 CHROUT Output a character to a channel
$FFCC CLRCHN Close channels

Since some of these routines destroy the data in the X and Y index registers, these have to be pushed onto the stack, and pulled off again after running the subroutine, as these registers contain the loop pointer and counter of the main program.

In the delay subroutine $C0BE to C0D7 a count value of 1 is again set in. This is to allow flexibility should a different serial bus printer be used and which requires some extra delay for internal operation or mechanically printing.

If the above programs are used with BASIC, and they are placed at the same positions in memory as shown, they can be called using SYS 49408 for the FX-80 parallel printer program at $C100, and SYS 49152 for the MPS-801 serial bus printer program at $C000. In these cases, locations $C067 and $C16C must contain $60 (RTS) and not $00 (Break).

NB: These programs are designed specifically to dump text, if they are used to dump graphics some odd effects may result.

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Eyes Down!!

No, we haven't started CCI Bingo! Bob Davis has written this program to make life easier for newspaper-bingo fanatics

BINGO AID is an easy to use, menu driven utility which will enable you to check your daily newspaper BINGO, as the numbers are printed each day or in one go on the last day.

Each bingo card supplied by the newspapers contain a certain number of games. Well, you can store all the games on each card to Tape or Disk (up to a maximum of 198 games in all). That is, if you have 10 cards then you can store 19 games from each card. The bingo numbers themselves can be entered as they appear and also saved, re-called and more numbers added at any stage.

HOW TO USE

When the program is first run you are asked to press "T" for Tape or "D" for Disk. If you are using Disk it is assumed your drive is DEVICE 8, DRIVE 0.

Now the main menu appears, awaiting your selection. Press the number you require followed by return. If there is no card data already in the computer you will be prevented from selecting the Check or Save modes as there would be nothing to check or save!

The first thing you will need to do is of course to enter your card data. This would be option 1. Before entering any data you must make sure that EACH bingo card you have has a unique identification. Number your cards; i.e., 1, 2, 3, 4 etc. When you are ready, press 1 and then return.

Now just follow the prompts. When you have answered all the questions, the bingo grid will appear with a cursor. The appropriate card's ID and game number will be displayed. You can now enter the numbers of that game. Note the first column only accepts single numbers (1 to 9) and that the rest expect numbers between 10 and 99. You cannot accidently over-type a number, so if you find an incorrect number then you must first delete it, using the 'space' bar. If you make any mistakes don't worry as you can check the cards later and edit them easily.

The cursor works normally by using the cursor up, down, left and right keys. The program keeps track of the quantity of numbers entered and once 15 numbers are in, the next game/card can be entered. When all the games on all the cards are entered then you can return to menu. A small tip here. If you are using TAPE don't forget, a large amount of games entered will take a long time to save, more importantly, to load. It is better to stick to say 20 games per save.

Checking card data (option 2) is straightforward, where you can check through all the games entered and edit them if required.

You can now save (option 3) the card data just entered. Do keep a careful note of the file names you allocate. Another tip: call them "SUN184‹189" (newspaper, games).

Loading a file (option 4) puts the card data back in memory ready for . . . . . .

Check for Bingo (option 5). Pressing 5 and return displays another menu. Note the loading and saving options in this mode now refer to the bingo numbers themselves, NOT the card data. Also note you are prevented from actually checking your bingo if no bingo numbers have been entered. So, first Press 1 to enter these numbers, and start entering. You can enter just part of the numbers or the whole lot. The maximum quantity of bingo numbers you can enter is 80. Again, if you make a mistake, you can edit these numbers easily, so don't worry, just carry on typing. Enter 0 to end this option. Now you can edit your numbers.

Editing is simple. Use the cursor control keys to place the flashing cursor where an incorrect number is seen, press "R" to replace it. If you find you have left out a number altogether, then place the cursor where that number should be, press "I" and insert your number. If you spot a number that shouldn't be there at all then place the cursor over that number and press "D" to delete it.

Load (2) allows you to load any bingo numbers previously saved, and then you can either continue entering more numbers (a tally of the numbers is kept) or go on to check for bingo.

Save (3) is to save the bingo numbers currently in memory. Tip: again, keep notes on the file's name. i.e., NUM184/5 (numbers, game number, date).

Checking for BINGO (4) is the simplest. Follow the prompts, sit back and watch it work! Any number matching on that card will be displayed in reverse field. When that game is checked the program waits for you to press any key before checking the next game. A FULL HOUSE displays an appropriate message!! . . . . Good luck.

Return to main menu (option 5) reminds you to save it you have any bingo numbers in memory. If you chose not to, remember these numbers will be lost.

QUIT (option 6) to the main menu, this quit option will prompt you to save if you have any card data in memory.

Program Notes

10–20	Initialise.
30–50	Get options from main menu.
60–120	Error trap. If data is in memory. . 'save?'.
130	End.
140–390	Creates new cards/games.
400–540	Check/Edit card data.
550–650	Save card data.
660–750	Load card data.
760–780	Check for bingo: Get option from sub-menu.
790	Display current bingo numbers, if any.
800–840	Enter bingo numbers.
850–900	Display numbers. Edit y/n?
910–1070	Edit bingo numbers.
1080–1250	Check for BINGO.
1260–1290	Return to main menu.
1300–1310	Load bingo numbers.
1320–1350	Save bingo numbers.

SUBROUTINES

1360–1400	Initialse Prior to Save.
1410–1450	Initialise Prior to Load.
1460–1480	Prints Bingo numbers.
1490	Message.
1500	Message.
1510–1590	Prints Bingo grid.
1600–1610	Message.
1620–1920	Gets card data from user, displays cursor, error checks, allocate card data to arrays.
1930–1940	"Y" or "N" response.
1950–1970	Print box.
1980–2040	Get file name.
2050–2150	Display appropriate error messages, or next game/card message.
2160–2190	Get device and set device flag.
2200–2270	Messages. Save/Load, File name.
2280–2290	Initialise. Set up variables.
2300–2400	Print title screen. If device flag is not set then get device. Print main menu options.
2410–2490	Print sub-menu (Check for

bingo).
2500 – 2550 Message. Full house.. BINGO.
2560 Sound routine.

VARIABLES

NI Number Input
R Row Value
NL Number Limit
C Column Value
CN Card Number
P Peek Value
GN Game Number
V String Value
G Games
N Numbers Entered
ET Error Trap
E General Purpose
EF Error Flag
F General Purpose
IL illegal Flag
L General Purpose
SD Screen Displacement
M General Purpose
SR Screen Ram
X General Purpose
CR Colour Ram
Y General Purpose
CB Check Bingo
Z General Purpose
EN Edit Number
DE General Purpose + Delay Loop
WT Win Track
DL General Purpose + Delay Loop
BN Bingo Numbers (Tally)
DV Device (Tape/Disk) stored
VL Variable Length in location 251
E, E$, E1 E2 are used for Disk error handling

R$ Cursor (Downs)
CN$ Card Name (File)
Z$ Cursor (Home + R$ + R$)
RV$ Reverse Field
C$ Cursor (Rights)
G$ Edit messages
V$ Temporary Store
K$ Key Input, Load/Save message

N%(CN,H,14) Numbers (Card Data)
BN%(BN) Bingo numbers
R%(CN,G,14) Row (Card Data)
EN%(EN) Edit numbers
C%(CN,G,14) Column (Card Data)

```
10 DV=0:POKE53281,14:PRINT"▒▒";CHR$(8):POKE251,0
20 POKE54272,150:POKE54273,69:POKE54277,15:POKE54296,15:GOSUB2280
30 GOSUB2300
40 IFNI<1ORNI>6THEN30
50 NI=NI-1:ONNIGOTO400,550,660,760,70
60 IFCN=0THEN140
70 IFNI=5ANDCN=0THENEND
80 PRINT"▒▒▒▒▒                ****  WARNING ****"
90 PRINT"▒▒▒     THERE IS DATA ALREADY IN MEMORY▒":FORDE=0TO3:GOSUB2560:NEXT
100 GOSUB1950:PRINTZ$"▒▒ RETURN TO MENU TO SAVE ? ▒Y/N":GOSUB1930
110 IFK$="Y"THEN30
120 IFNI=3THEN670
130 IFNI=5THENEND
140 CLR:GOSUB2280:PRINT"▒▒▒ CREATE NEW CARDS▒"
150 NL=2:GOSUB1950:PRINTZ$"▒▒ HOW MANY CARDS DO YOU HAVE ? ";:GOSUB1980:CN=NI
160 IFCN=0THENIL=1:GOSUB2050:GOTO150
170 GN=INT(199/CN):K$=RIGHT$(STR$(GN),2)
180 GOSUB1950:PRINTZ$"▒▒ HOW MANY GAMES PER CARD ("K$") ? ";:GOSUB1980
190 G=NI:IFG<1ORG>GNTHENIL=1:GOSUB2050:GOTO170
200 GOSUB1950:PRINTZ$"▒▒ NUMBER OF THE FIRST GAME ? ";:NL=4:GOSUB1980:GN=NI
210 IFGN<1THENIL=1:GOSUB2050:GOTO200
220 GOSUB1950:PRINT"▒"R$:
230 PRINT" YOU HAVE:"SPC(3+(CN>99)+(CN>9))CN"CARDS";:IFCN=1THENPRINT"▒ ";
240 PRINT" WITH"SPC(2+(G>99)+(G>9))G"GAMES ON":PRINT
250 PRINT" EACH CARD AND THE FIRST GAME NUMBER IS":PRINT:PRINTGN
260 PRINTZ$"▒▒  PRESS ▒C▒ TO CONTINUE OR ▒M▒ FOR MENU"
270 GETK$:IFK$<>"C"ANDK$<>"M"THEN270
280 IFK$="M"THENRUN20
290 GOSUB1950:PRINTZ$"▒▒   PLEASE WAIT..."
300 DIMN%(CN,G,14),R%(CN,G,14),C%(CN,G,14):SD=54272:EF=1
310 FORE=1TOCN:FORF=1TOG:PRINT"▒":GOSUB2560:GOSUB1500
320 GOSUB1510:GOSUB1950:PRINTZ$"▒▒";:GOSUB1600
330 L=0:GOSUB1620:IFE=CNANDF=GTHEN350
340 IL=0:GOSUB2050:NEXTF,E
350 PRINT"▒▒"R$"▒▒▒      ▒╭──────────────────────────────╮"
360 PRINT"      ▒│ ALL THE GAMES ARE NOW ENTERED  │"
370 PRINT"      ▒╰──────────────────────────────╯▒":GOSUB2560
380 GOSUB1950:PRINTZ$"▒▒   DO YOU WANT TO CHECK THEM ?  ▒Y/N"
390 GOSUB1930:IFK$="N"THEN30
400 IFCN=0THENIL=2:GOSUB2050:GOTO30
410 E=1:F=1
420 PRINT"▒▒▒ CHECK CARDS"R$"▒▒▒▒▒▒ ":GOSUB1600:GOSUB1510
430 FORM=0TO14:PRINT"▒";
440 PRINTLEFT$(R$,R%(E,F,M)*2+6)+LEFT$(C$,C%(E,F,M)*3+1);:K$=STR$(N%(E,F,M))
450 IFLEN(K$)>2THENK$=RIGHT$(K$,2)
460 PRINTK$:NEXTM
470 GOSUB1950:PRINTZ$"▒▒  PRESS:   ▒N▒EXT CARD ;   ▒E▒DIT  ;   ▒M▒ENU"
480 GETK$:IFK$<>"N"ANDK$<>"E"ANDK$<>"M"THEN480
490 IFK$="E"THEN530
500 IFK$="M"THEN30
510 F=F+1:IFF>GTHENF=1:E=E+1:IFE>CNTHEN30
520 GOTO420
530 GOSUB1950:PRINTZ$"▒▒ ▒EDIT▒  DELETE ANY NUMBER AND RE-ENTER"
540 EF=0:L=15:GOSUB1500:GOSUB1620:EF=1:GOTO420
550 IFCN=0THENIL=2:GOSUB2050:GOTO30
560 GOSUB1360:IFK$="N"ORDV=8ANDETHEN30
570 CN$=V$:PRINT#1,CN;CHR$(13);
580 PRINT#1,G;CHR$(13);
590 PRINT#1,GN;CHR$(13);
600 FORE=1TOCN:FORF=1TOG:FORDE=0TO14
610 PRINT#1,N%(E,F,DE);CHR$(13);
```

```
620 PRINT#1,R%(E,F,DE);CHR$(13);
630 PRINT#1,C%(E,F,DE);CHR$(13);
640 NEXTDE,F,E
650 CLOSE15:CLOSE1:GOTO30
660 IFCN>0THEN80
670 CLR:GOSUB2280:GOSUB1410:IFK$="N"ORDV=8ANDETHEN30
680 CN$=V$:INPUT#1,CN,G,GN
690 DIMN%(CN,G,14),R%(CN,G,14),C%(CN,G,14):SD=54272:EF=1
700 FORE=1TOCN:FORF=1TOG:FORDE=0TO14
710 INPUT#1,N%(E,F,DE)
720 INPUT#1,R%(E,F,DE)
730 INPUT#1,C%(E,F,DE)
740 NEXTDE,F,E
750 CLOSE1:CLOSE15:GOTO30
760 IFCN=0THENIL=2:GOSUB2050:GOTO30
770 GOSUB2410:IFNI<1ORNI>5THEN760
780 NI=NI-1:ONNIGOTO1300,1320,850,1260
790 BN=BN+1:RV$="":PRINT"█":FORDE=0TOBN:GOSUB1460:NEXT
800 PRINT"██ ENTER BINGO NUMBERS.  ENTER '0' TO END█"
810 GOSUB1950:PRINTZ$"██ TALLY:"BN+1"          NUMBER ? ";:NL=2:GOSUB1980
820 IFNI>0ANDBN<80THENBN%(BN)=NI:DE=BN:GOSUB1460:BN=BN+1:GOTO810
830 BN=BN-1:IFBN>-1THEN880
840 GOTO760
850 IFBN=-1THENIL=2:GOSUB2050:GOTO760
860 PRINT"███ THE NUMBERS IN MEMORY SO FAR ARE :█"
870 RV$="":FORDE=0TOBN:GOSUB1460:NEXT
880 GOSUB1950:PRINTZ$"██ EDIT NUMBERS ? █Y/N":GOSUB1930:DE=0:IFK$="Y"THEN910
890 IFNI=3THEN1080
900 GOTO760
910 GOSUB1950:PRINTZ$"██ PRESS: █I█NSERT; █D█ELETE; █R█EPLACE; █M█ENU"
920 PRINT"█      CURSOR : UP/DOWN/LEFT/RIGHT"
930 RV$="██":GOSUB1460:GETK$
940 IFK$="I"THENG$=" INSERT;":GOSUB1060:GOTO1040
950 IFK$="D"THENFORX=DE+1TOBN:BN%(X-1)=BN%(X):NEXT:BN%(BN)=0:BN=BN-1:GOTO1050
960 IFK$="R"THENG$="REPLACE;":GOSUB1060:BN%(DE)=NI:GOTO910
970 IFK$="M"THEN760
980 RV$="":GOSUB1460
990 IFK$="█"THENDE=DE+1+(DE=BN):GOTO930
1000 IFK$="█"THENDE=DE+(DE>0):GOTO930
1010 IFK$="█"ANDDE+10<=BNTHENDE=DE+10:GOTO930
1020 IFK$="█"ANDDE-10>-1THENDE=DE-10
1030 GOTO930
1040 FORX=BNTODESTEP-1:BN%(X+1)=BN%(X):NEXT:BN=BN+1:BN%(DE)=NI
1050 DL=DE:FORDE=DETOBN+1:RV$="":GOSUB1460:NEXT:DE=DL:GOTO910
1060 GOSUB1950:PRINTZ$"██ "G$" ENTER NUMBER :";:NL=2:GOSUB1980:IFNI<1THEN1060
1070 RETURN
1080 PRINT"█████ CHECK FOR BINGO█":PRINT"██ FILE NAME :█"CN$"█"
1090 PRINT"██ YOU HAVE :"CN"CARDS WITH "G"GAMES ON":
1100 PRINT"█ EACH CARD IN MEMORY AND THE FIRST GAME":PRINT"█ NUMBER IS :";GN
1110 GOSUB1950:PRINTZ$"██ GAME NUMBER TO BE CKECKED ? ";:NL=4
1120 GOSUB1980:IFNI<GNORNI>GN+G-1THENIL=1:GOSUB2050:GOTO1080
1130 CB=NI:E=1
1140 PRINT"██ FILE: █"CN$"█":GOSUB1510:GOSUB1950
1150 PRINTZ$"███  CHECKING :     CARD█"E"█, GAME█"CB:WT=0:FORM=0TO14:F=CB-GN+1
1160 PRINT"█"LEFT$(R$,R%(E,F,M)*2+6)+LEFT$(C$,C%(E,F,M)*3+1);
1170 K$=STR$(N%(E,F,M)):IFLEN(K$)>2THENK$=RIGHT$(K$,2)
1180 FORZ=0TOBN:IFBN%(Z)=VAL(K$)THENK$="██"+K$+"██":WT=WT+1:GOSUB2560
1190 NEXTZ:PRINTK$:NEXTM:IFWT=15THEN2500
1200 IFE=CNTHEN1230
1210 PRINT"█"R$"████      PRESS ANY KEY FOR NEXT CARD"
1220 POKE198,0:WAIT198,1:E=E+1:GOTO1140
1230 PRINT"█"R$"███ GAME"CB"ON ALL THE CARDS HAVE BEEN"
1240 PRINT"█ CHECKED. BETTER LUCK NEXT TIME.":PRINT"█ RETURING TO MENU......"
1250 FORDE=0TO8000:NEXT:GOTO760
1260 IFBN=-1THEN30
1270 PRINTZ$"███  █YOU HAVE"BN+1"BINGO NUMBERS IN MEMORY█"
1280 GOSUB1950:PRINTZ$"██ DO YOU WISH TO SAVE ? █Y/N":GOSUB1930:IFK$="Y"THEN1320
1290 FORDE=0TOBN:BN%(DE)=0:NEXT:BN=-1:GOTO30
1300 GOSUB1410:IFK$="N"ORDV=8ANDETHEN760
1310 INPUT#1,BN:FORDE=0TOBN:INPUT#1,BN%(DE):NEXT:CLOSE1:CLOSE15:GOTO850
1320 IFBN=-1THENIL=2:GOSUB2050:GOTO760
1330 GOSUB1360:IFK$="N"ORDV=8ANDETHEN760
1340 PRINT#1,BN;CHR$(13);:FORDE=0TOBN:PRINT#1,BN%(DE);CHR$(13);:NEXT
1350 CLOSE1:CLOSE15:GOTO760
1360 K$="SAVE":GOSUB2200:IFK$="N"THENRETURN
1370 GOSUB1950:GOSUB2240:IFDV=1THENPRINT"███SAVING...██":OPEN1,1,2,V$:RETURN
1380 OPEN15,8,15:PRINT#15,"I0":OPEN1,8,2,"0:"+V$+",S,W":INPUT#15,E,E$,E1,E2
1390 IFETHENGOSUB1950:PRINTZ$"██ █"E$"█ :"V$:CLOSE15:CLOSE1:FORDE=0TO3000:NEXT
1400 RETURN
1410 K$="LOAD":GOSUB2200:IFK$="N"THENRETURN
1420 GOSUB1950:GOSUB2240:IFDV=1THENPRINT"███LOADING...██":OPEN1,1,0,V$:RETURN
```

```
1430 OPEN15,8,15:PRINT#15,"I0":OPEN1,8,2,"0:"+V$+",S,R":INPUT#15,E,E$,E1,E2
1440 IFETHENGOSUB1950:PRINTZ$"▚▌ ▣"E$"■ :"V$:CLOSE15:CLOSE1:FORDE=0TO5000:NEXT
1450 RETURN
1460 PRINT"▨▚▚":Y=INT(DE/10):X=DE-Y*10:FORL=0TOY*2:PRINT:NEXT:PRINTSPC(X*4);
1470 IFBN%(DE)=0THENPRINT"    ":RETURN
1480 PRINT" "+RV$+RIGHT$(STR$(BN%(DE)),3+1*(BN%(DE)>9))+"■▩":RETURN
1490 PRINT"▨"R$"▚▚▚ NUMBERS ENTERED: "L:RETURN
1500 PRINT"▨▚ CURSOR : UP/DOWN/LEFT/RIGHT":PRINT"▚ DELETE : SPACE BAR":RETURN
1510 PRINT"▨▚▚▚▚▚"
1520 PRINT"■┌───┬───┬───┬───┬───┬───┬───┬───┬───┬───┐
1530 PRINT"│   │   │   │   │   │   │   │   │   │   │ CARDS:"CN
1540 PRINT"├───┼───┼───┼───┼───┼───┼───┼───┼───┼───┤
1550 PRINT"│   │   │   │   │   │   │   │   │   │   │
1560 PRINT"├───┼───┼───┼───┼───┼───┼───┼───┼───┼───┤
1570 PRINT"│   │   │   │   │   │   │   │   │   │   │ GAMES:"G
1580 PRINT"└───┴───┴───┴───┴───┴───┴───┴───┴───┴───┘▩
1590 RETURN
1600 PRINT" CARD NUMBER:"SPC(2+(E>9))E;
1610 DE=F+GN-1:PRINT"  GAME NUMBER:"SPC(3+(DE>999)+(DE>99)+(DE>9))DE:RETURN
1620 R=0:C=0:EN=0:K$="":GOSUB1490
1630 SR=1265+R*80+C*3
1640 P=PEEK(SR):CR=SR+SD:POKESR,P+128:POKECR,1
1650 GETK$:IFK$=""THEN1650
1660 POKESR,P:POKECR,6
1670 IFK$="▐"THENC=C+1+(C>7):GOTO1630
1680 IFK$="▌"THENC=C+(C>0):GOTO1630
1690 IFK$="▚"THENR=R+1+(R>1):GOTO1630
1700 IFK$="⌝"THENR=R+(R>0):GOTO1630
1710 IFK$>"0"ANDK$<":"ANDPEEK(SR+1)=32ANDL<15THENV$=K$:V=VAL(V$):GOTO1770
1720 IFK$=" "ANDPEEK(SR+1)<>32THEN1740
1730 GOTO1630
1740 FORDE=0TO14:V=VAL(CHR$(PEEK(SR))+CHR$(PEEK(SR+1)))
1750 IFN%(E,F,DE)=VTHENN%(E,F,DE)=0:EN%(EN)=DE:EN=EN+1
1760 NEXT:GOTO1890
1770 POKESR,V+48:POKECR,6:SR=SR+1:CR=CR+1:POKESR,160:POKECR,1
1780 IFC=0THENPOKESR,V+48:POKESR-1,32:POKECR,6:GOTO1830
1790 GETK$:IFK$=""THEN1790
1800 IFK$=" "THENPOKESR,32:POKESR-1,32:GOTO1630
1810 IFK$<"0"ORK$>"9"THEN1790
1820 V$=V$+K$:V=VAL(K$):POKESR,V+48:POKECR,6:SR=SR-1
1830 ET=0:FORDE=0TO14:IFN%(E,F,DE)=VAL(V$)THENET=1:IFC=0THENSR=SR-1
1840 NEXT:IFET=0THEN1860
1850 IL=1:GOSUB2050:GOSUB1490:GOTO1900
1860 IFEF>0THENN%(E,F,L)=VAL(V$):R%(E,F,L)=R:C%(E,F,L)=C:GOTO1880
1870 EN=EN-1:N%(E,F,EN%(EN))=VAL(V$):R%(E,F,EN%(EN))=R:C%(E,F,EN%(EN))=C
1880 L=L+1:GOTO1910
1890 L=L+1*(L>0)
1900 POKESR,32:POKESR+1,32
1910 PRINT"▨"R$"▚▚▚"LEFT$(C$,18)"      ▨"R$"▚▚▚"LEFT$(C$,18)L:IFL=15THENRETURN
1920 GOTO1630
1930 GETK$:IFK$<>"Y"ANDK$<>"N"THEN1930
1940 RETURN
1950 PRINTZ$"╭────────────────────────────────────────╮";
1960 PRINT"│                                       │";
1970 PRINT"╰────────────────────────────────────────╯":RETURN
1980 K$="":V$="":N=0:NI=0
1990 PRINT"▣+ ▌▌";:POKE198,0:WAIT198,1:K$=CHR$(PEEK(631)):VL=LEN(V$)
2000 IFK$=CHR$(13)THENNI=VAL(V$):PRINT"▩":RETURN
2010 IFK$=CHR$(20)ANDVL>0THENV$=LEFT$(V$,VL-1):PRINT"▌";:N=N+(N>0):GOTO1990
2020 IFK$<"0"ORK$>"Z"THEN1990
2030 IFN<NLTHENN=N+1:V$=V$+K$:PRINTK$;:
2040 GOTO1990
2050 POKE649,0:PRINT"▩▨"R$"▚▚"TAB(9)"▣╭──────────────────────╮"
2060 PRINTTAB(9);:IFIL=1THENIL=0:PRINT"▣|*** ILLEGAL ENTRY ***|":GOTO2100
2070 IFIL=2THENIL=0:PRINT"▣|* NO DATA IN MEMORY *|":GOTO2100
2080 IFF=GTHENPRINT"▣|***  NEXT   CARD  ***|":GOTO2100
2090 PRINT"▣| NEXT GAME.THIS CARD |"
2100 PRINTTAB(9)"▣|                     |"
2110 PRINTTAB(9)"▣|   PRESS SPACE BAR   |"
2120 PRINTTAB(9)"▣╰──────────────────────╯▩"
2130 GOSUB2560:FORDE=0TO300:NEXT:GOSUB2560:POKE649,10
2140 GETK$:IFK$<>" "THEN2140
2150 FORDE=0TO4:PRINT"⌝                                        ⌝":NEXT:RETURN
2160 PRINTZ$"▚▌    ARE YOU USING ▣T■APE OR ▣D■ISK ?"
2170 GETK$:IFK$<>"T"ANDK$<>"D"THEN2170
2180 POKE251,1:IFK$="D"THENPOKE251,8
2190 DV=PEEK(251):RETURN
2200 PRINT"⌝▩▚▚▚▚"TAB(9)"▣╭──────────────────────╮"
2210 PRINTTAB(9)"▣|PREPARE TO "K$" FILE|"
2220 PRINTTAB(9)"▣╰──────────────────────╯▩"
2230 GOSUB1950:PRINTZ$"▚▩ CONTINUE ?  ▣Y/N■":GOTO1930
```

```
2240 DV=PEEK(251):K$="TAPE":IFDV=8THENK$="DISK"
2250 PRINT"███████████          ENSURE THE "K$" IS SET UP"
2260 PRINT"█         PRESS ANY KEY TO CONTINUE":POKE198,0:WAIT198,1
2270 PRINTZ$"██ ENTER FILE NAME  :  ";:NL=16:GOSUB1980:RETURN
2280 C$="███████████████████████████████":R$="██████████":Z$="█"+R$+R$:CN$=""
2290 DIMBN%(80),EN%(15):ZL=0:BN=-1:RETURN
2300 PRINT"███                ╭───────────╮
2310 PRINT"               |  BINGO  AID  |
2320 PRINT"               ╰───────────╯
2330 PRINT"█                    BY
2340 PRINT"█                 BOB DAVIS
2350 PRINT"█               (C) JAN 1985█
2360 IFPEEK(251)=0THENGOSUB2560:GOSUB1950:GOSUB2160:GOTO2300
2370 PRINT"██  1.CREATE NEW CARDS  4.LOAD CARD DATA"
2380 PRINT"█  2.CHECK CARD DATA    5.CHECK FOR BINGO"
2390 PRINT"█  3.SAVE CARD DATA     6.QUIT
2400 GOSUB1950:PRINTZ$"██ SELECT OPTION ? ";:NL=1:GOSUB2560:GOSUB1980:RETURN
2410 PRINT"████           ╭──────────────────╮"
2420 PRINT"            | CHECK BINGO NUMBERS  |"
2430 PRINT"            ╰──────────────────╯"
2440 PRINT"███      1. ENTER BINGO NUMBERS
2450 PRINT"█     2. LOAD ←╮
2460 PRINT"                ├ NUMBER'S FILE
2470 PRINT"     3. SAVE ←╯
2480 PRINT"█     4. CHECK FOR BINGO"
2490 PRINT"█     5. MAIN MENU (CLEAR NUMBERS)█":GOTO2400
2500 FORDE=0TO9:PRINT"██████"R$TAB(8)"█    CONGRATULATIONS     ":GOSUB2560
2510 FORDL=0TO100:NEXT:PRINT"██████"R$TAB(8)"██BINGO BINGO BINGO BINGO█"
2520 FORDL=0TO50:NEXTDL,DE:PRINT"████████"R$TAB(8)"█      PRESS ANY KEY█"
2530 POKE198,0:WAIT198,1
2540 PRINT"█"R$R$"                                        "
2550 GOTO760
2560 POKE54276,17:FORDL=0TO100:NEXT:POKE54276,16:RETURN

READY.
```

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New Basic for 64

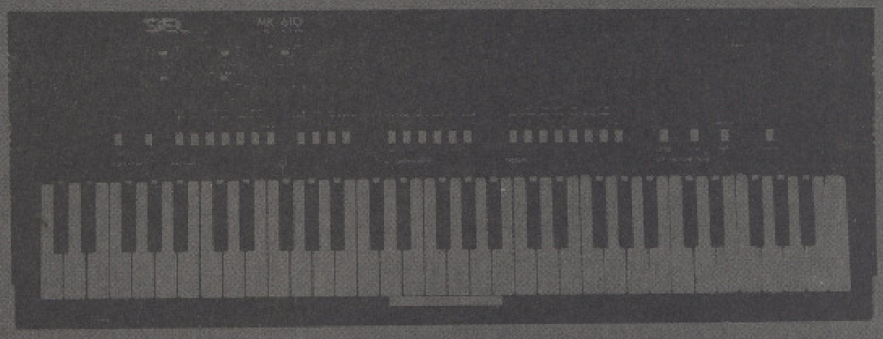
Perhaps the most respected basic on the market today is BBC Basic, it is very well structured, it is simple to learn and it is very fast. Now BBC Basic of a sort is available to 64 owners care of Aztec Software BBC Basic Emulator.

From what I can see all the graphics are the same and you can also use 80 column mode (mode 0) and full on screen editing is also there. All the error messages generated are the same as on the BBC and the only real omission I can tell from the Press release is the random access disk commands, which is not suprising as the Commodore does not have a 8271 disc controller chip.

At £14.95 it seems that, if it has been executed well, this could be the answer to a lot of peoples problems with the 64.

Contact: Micro Dealer UK Ltd, 29 Burrowfield, Welwyn Garden City, Hertfordshire AL7 4SS. Tel: 07073 28181.

MIDI keyboard



For those of you interested in interfacing MIDI-instruments to your 64, this picture shows one of Siel's new home computer keyboards. At £329, the MK610 features PCM voices, 61 full-size keys, sequencer and is RS232/MIDI compatible

Musical notes

Siel have recently announced three new products for the Commodore 64. All musically orientated, the first is a 'MIDI 16-Track Live Sequencer'. This program allows you to create very complicated musical scores and then edit and replay them. There is a graphical display, while you are playing, of the memory bits being used, plus the number of notes played.

The next of Siel's programs is a 'MIDI Multitrack Composer'. This consists of a six channel pulse time sequencer with each monophonic track being written from the Qwerty keyboard. The detailed information is inputted in terms of step number, note name and octave, note duration and gate time. Instant editing is available and many commands are set up for use with the function keys.

Finally Siel has released its 'Data Base Synthesizer'. Designed to work in conjunction with a wide variety of Synths that have MIDI input, it allows you to store up to 250 programs per file, meaning you can create a library of created sounds for your synth easily on your 64. The software has many built-in safety features to protect previously created sounds, as well as full editing, viewing and deleting on screen.

Contact: Siel (UK) Ltd, Ahed Depot, Reigate Road, Hookwood, Horley, Surrey RH6 0AY. Tel: 0293 776153/4.

Spriinter cures problems

At last there appears to be an answer to the many interfacing problems between incompatible computers and peripherals. The Spriinter is basically a Printer buffer with a maximum of 32K memory as a buffer. This alone is a valuable tool, but together with split baud rate i/o and the optional t-switches it becomes an extremely useful tool.

As well as the above functions it also comes with firmware/hardware enabling baud rates and handshake protocols to be converted. Prices start at £119 but vary depending on what options you want in the way of extras.

Contact: MUTEK (MSS) Ltd, Quarry Hill, Box, Wiltshire SN14 9HT. Tel: 0225 743289.

Comptel Telex

Recently released for the Commodore PC is Comptel. Comptel is a telex management system for the PC 10 and 20 consisting of software and hardware to connect you into the standard UK and International telex networks.

Comptel includes comprehensive software with auto dial and redial facility as well as a store of frequently used numbers. The actual telexes are written using Wordstar or Superwriter wordprocessing software.

As well as sending telexes Comptel can receive them, even when the computer is performing other tasks.

Contact: North Wales Computer Services, 12 Penrhyn Road, Colwyn Bay, Clwyd LL29 8LG. Tel: 0492 33151.

128 Software

Business style software specifically designed for the 128 has been announced by Precision, for release at the same time as the first shipments of 128s are due in September.

Superbase is already very well known and respected for its speed and ease of use.

Superscript is a redesigned version of Easyscript featuring an impressive 30,000 word spelling checker. Also included is a mailmerge feature and an interactive five function calculator.

Both Superscript and Superbase operate either in 40 or 80 column mode and can be used separately or together as a linked office system.

Contact: Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ. Tel: 01-330 7166.

More Music

EMR has recently announced its attempt to corner the MIDI market. EMR produce a MIDI interface for the 64 costing around £80 and some software called the 'Performer'.

The features of this seems very comprehensive including eight fully polyphonic tracks for record and playback of all current MIDI performance data. All the technical facilities you would want to create some pretty impressive music using MIDI instruments and rhythm sections.

The 'Performer' costs around £45 and for anyone with serious musical pretensions this should be considered.

Contact: EMR, 14 Mount Close, Wickford, Essex SS11 8HG. Tel: 0702 335747.

Well-worded!

Bill Donald enthuses over Superscript 64

WHAT? . . . I hear you cry, not another word processor for the Commodore 64. I must admit that I felt very much the same when I first saw the publicity for Precision Software's latest offering to the keyboard bashers. However, in the interests of our dear readers, here is my review of SUPERSCRIPT 64.

So what does SUPERSCRIPT 64 have to offer over a very strongly contested market for Commodore 64 applications software? The simple answer is an awful lot; in my view SUPERSCRIPT 64 simply walks all over the competition and like SUPERBASE 64 before it, is another blinder from Precision Software Ltd.

The SUPERSCRIPT 64 package contains the User Manual and system disk. The system disk provides a backup since it is double-sided. Like SUPERBASE 64 Version 2.02 registered users can purchase a separate backup disk for £11.50. There was no training audio cassette with my copy of the program although there are plans afoot for the incorporation of this detail by Precision Software. Personally I did not miss this, since having cut my word processing teeth on EASYSCRIPT, the transition to SUPERSCRIPT 64 was quite painless.

"Manual is a model of clarity"

The documentation in the form of the User Manual is beyond reproach and is the usual extremely high standard we have come to expect from Precision Software. Apart from being a model of clarity it is very comprehensive. Perhaps it's strongest point being the coverage given to printers. Given the huge range of printers available, Precision Software have made a very credible attempt to enable the user of SUPERSCRIPT 64 to access the features of whatever make of printer you have hung onto the User Port. Suffice it to say that irrespective of interface, viz. RS-232, IEEE or Centronics, in addition to the Commodore Serial Bus, the User Manual will allow you to cope with most problems. As an indication of how comprehensive the details are, Precision Software have even provided an accurate pin-out diagram for a Centronics cable from the User Port.

The User Manual is in four parts, the first being a series of tutorials on how to use SUPERSCRIPT 64. Thankfully Precision Software have included on the system disk several text documents which form the basis of your butchery (oops sorry, training!). This does get you into the system fairly quickly without having to type in great lumps of text. The second part deals with further features of SUPERSCRIPT 64 as well as the previously mentioned printer details. The third section serves as a reference to the overall program operating structure. The fourth and final section deals with system error messages from within the program, machine operating system (KERNAL) or disk drive. It is a refreshing change to see the inclusion of this and more importantly (software developers please note) an *explanation of what they mean in the context of the program*. Also included are details of converting disk sequential files from other word processors, in particular EASYSCRIPT and EASYSPELL. Note that the process is only one way, in SUPERSCRIPT's direction. VISAWRITE (OMNIWRITER) files are stored on the disk as PGM files and I would have liked to have seen the inclusion with SUPERSCRIPT 64 the option to convert these to SEQ files. If you do need to do this a number of conversion routes exist, although it is worth remembering that the first 200 bytes of the VISAWRITE file should be stripped off at some stage since they essentially contain format data for the file.

"UK or US type spelling dictionary"

The program after loading presents a menu screen with four options. These include creating a dictionary/training disk, with UK or US type spelling, creating a work disk or using an existing work disk. The creation of a dictionary/training disk causes the transfer of the bulk of the files contained on the system disk to the work disk and although SUPERSCRIPT 64 supports the use of dual drives such as the 4040 during this sequence, it does not support separate units, so rather like SUPERBASE 64 this mode is tedious and time consuming. Thankfully you should only have to create one or two dictionary/training disks so it is not too bad. Every disk formatted under SUPERSCRIPT 64 will contain the very important DEFAULTS file. This contains, amongst other information, the data on the type of printer you have specified, the default being Commodore dot matrix. Since the 'defaults' file is held on the disk as a sequential file it can be editied at any time to change the other data in it such as screen colours, width, etc. The system disk also contains a PRINTER TEST file which should be run after you have defined the printer type to the system to check that all is well at the output end.

"Duckshoot style menu"

SUPERSCRIPT 64 operates in three modes; menu, multiple key commands and user-defined key multiple commands, all of these being accessed by pressing the F1 key. The new user of SUPERSCRIPT 64 will probably stay within the menu mode which operates in a manner similar to the COMPUNET 'duckshoot' (the idea of which was lifted from LOTUS 1-2-3 and in turn from mainframe computers). The colour of the duckshoot can be defined by the defaults file so it is possible to formulate a colour coding scheme for different types of document disks. Unlike the COMPUNET duckshoot there is no backtrack command shown but pressing the RUN/STOP key fulfills this function. In fact if you do get into a tangle with SUPERSCRIPT 64 pressing the RUN/STOP and RESTORE will rectify matters. This works by vectoring the NMI interrupt generated back to the main screen. The commands selected from the duckshoot menu are briefly explained on a line which is situated just below the duckshoot and is in reverse video for clarity; the colour of this line can be user-defined, (another point to note for software developers).

As you progress along the learning curve with SUPERSCRIPT 64 you can bypass the menu and hence save time by using single key commands. For example, pressing F1 D D will get you the disk directory. Similarly the CTRL and the other F keys are used extensively. To assist in assimilating the numerous commands at your disposal a help screen is available from F8. User-error trapping is built into SUPERSCRIPT 64 by means of proceed/abandon prompts at the potential disaster spots such as text or file erasures.

"Ability to define command strings"

However, the most powerful feature of SUPERSCRIPT 64 is the ability to define command strings. These can be temporarily or permanently embedded in the text or file and since the machine maximum memory allowed for this facility is 1k, it is unlikely that you will run out of space. These command strings can consist of complete names and addresses, glossaries, switching to another drive. In fact any of the SUPERSCRIPT

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Incorporates Centronics printer software (user port) **with CBM graphics** capability. See "Commodore Connexion" for suitable lead.

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Fast File Copier
An **incredibly handy** selective file copier that LOADs and SAVEs at **five times** normal speed. Sounds useful? You won't believe how much until you have used it.

As well as these programs "Disc Disector" incorporates a whole host of useful utilities including the following. **Fast Format**, **Selective Menu Maker**, **Disc Editor** (new sophisticated machine code version), **Scratch/Unscratch**, **Fastcopy**, **Rename**, **Fastload** (four times faster), etc. etc. This program is an **essential purchase** for the 1541 user.

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Customers with earlier versions may return them along with £9.95 for "V3.0".

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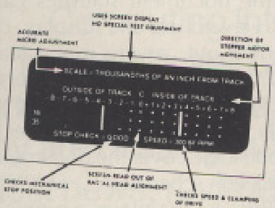

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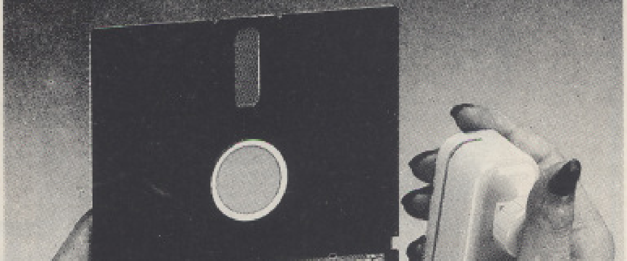

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64 commands are available, therefore the possibilities are endless. It works by the user selecting and defining a single key to act as the trigger for a command string to be executed or a block of text to be inserted in the text at that point. For instance by defining your name and address into a command string and then appending this into your defaults file on your 'personal letters' disk, each time you press this key (having first called it), your name and address will be inserted into the text, a huge time saver. It is surely this feature alone that makes SUPERSCRIPT 64 worth the money!

"Wordwraps in forty columns"

The actual text format commands appear on screen as reverse video characters, which in a lot of instances are similar to those used by EASYSCRIPT. But where SUPERSCRIPT 64 scores over ALL OTHER word processors for the Commodore 64 is in the approach to the screen. It wordwraps in forty columns. This means that instead of the scrolling window technique of the WYSIWYG word processors or the words chopped in half by the edge of the screen by the EASYSCRIPT types which also makes for difficult reading, SUPERSCRIPT 64 detects when a word has been broken by the screen edge and wraps it around onto the next line. This makes for very clean text with the absolute minimum of difficulty in reading it. If you have found it necessary to edit the text which has caused word breakage then simply pressing CTRL X will reformat the text back to the beautiful clarity of before.

"Range of text formatting is breathtaking"

For the experienced or professional users of word processors the range of text formatting with SUPERSCRIPT 64 is breathtaking. Precision Software have built onto the fundamentally sound EASYSCRIPT chassis such features as view/print alternate pages, selective headings and footings, substantial enhancements to cut and paste or boilerplating, detailed file handling and merging, columns and number tables, calculations on numeric data within a document.

"Unique calculation ability"

The calculation ability of SUPERSCRIPT 64 is unique amongst word processors for the Commodore 64 and this feature coupled with command string definition and sophisticated file handling allows some enviable serious applications to be undertaken.

Oh, I nearly forgot the intergrated spelling checker. This is based on EASYSPELL and is enhanced in two ways. Firstly the user has the option of either utilising UK or US derived spelling (no need to purchase separate program diks), and secondly the document statistics can be viewed on the display or printed out, a very useful feature for journalists and writers. Incidentally there is no need to fully engage the spelling check mode to discover the document statistics because SUPERSCRIPT 64 maintains a running total of these figures.

Any complaints? Well not really since they are more directed at the shortcomings of the machine rather than the program. Operation of the spelling check mode is very much dependent on the document length. I did manage to get the OUT OF MEMORY error message for this particular article, but since it is over 3000 words long, it was not surprising, roll on my Commodore 128! The source code for SUPERSCRIP9T 64 itself occupies more than 20k so loading the spelling checker on top of that along with my text simply beyond the machine's ability. The answer was to split the document into three and link them consecutively. Similarly I would have liked to see individual paragraph or character colour attributes, but once more this would soak up machine RAM leaving less for the user.

The cost of SUPERSCRIPT 64 is an extremely reasonable £69.95. Perhaps the biggest attraction lies in the fact that existing users of EASYSCRIPT can upgrade to SUPERSCRIPT 64 by sending to Precision an EASYSCRIPT system disk and the front cover of the EASYSCRIPT manual along with a cheque for £39.95. This really has to be the BARGAIN OF THE YEAR.

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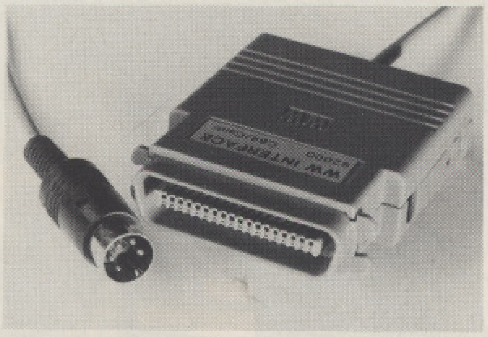

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All at C: a useful tool

Following last month's first impression of the C language, Tony Lydeard goes into the product in-depth

Dennis Ritchie created C from Ken Thompson's B language back in 1972, when the pair of them were working together on the UNIX operating system. He might not have shown much imagination in this choice of name but he did invent a very useful tool for programmers who don't like the idea of their masterpieces being restricted to just one machine. (He also created in irresistible temptation for hacks who enjoy writing "clever" headlines – if you C what I mean.)

The fundamental principle behind the whole thing is that the same symbols will be recognised by a number of different compilers which will convert the high level "source code" into machine code for the computer in question. You can, for example, write a program on your Commodore 64 then upload it to an IMB PC. Provided that the owner of the IBM has a C compiler, he or she can compile your program and run it without making any alterations at all. The same applies to any other computer, be it micro, mini or mainframe. It's not necessary to be a genius to grasp the implications. A lot of professional programmers write in C and sell the compiled results as machine code software for a whole range of machines.

"C can link to MC routines"

Nothing is quite as quick or as compact as hand-assembled machine code but, as owners of other compilers will testify, you can get pretty close. C has the added advantage that it can link to machine code routines in order to speed up any particular section that seems a little tardy or bulky. Graphics, of course, are so machine specific that no "universal" language could possibly implement them comprehensively. Sensibly, C makes no attempt to do so.

C was designed to occupy the smallest possible amount of memory in the computer. Thus the system is comprised of a number of functions and routines which reside on disk and are loaded into memory as and when they are required, enabling enormous programs to be written and compiled without the compiler itself taking up valuable memory. The 1541's leisurely approach to life can cause a little frustration in this respect.

The user can define functions for use within his or her program and any function can call any other function (or even itself) during the course of its operation, which makes looping and nesting straightforward. In addition, there is a preprocessor, which allows certain facilities to be included, definitions to be stated and conditions to be set before the start of the program proper.

SAMS
C Primer Plus
Mitchell Waite Stephen Prata Donald Martin

"A reasonable investment"

The package I have been looking at consists of a book called "C Primer Plus" and a double-sided disk called "C Power" which has its own loose-leaf manual. The whole lot, as I mentioned last month, costs a hefty £119.95 – a lot of money if computing is your hobby but a reasonable investment if you intend writing best-selling software with it.

The book is a 530-page paperback which is intended to be a complete "Teach Yourself C". Each chapter begins with a blue page on which is summarised the contents of the chapter and ends with a few questions which test your understanding of what you have read. (The answers to the questions are printed immediately after the questions so they can be thought of as worked examples). There is even an index, so finding your way around the book is unusually straightforward. The text is liberally illustrated with diagrams which I found helpful and inferior quality cartoons which I found irritating. The overall style of presentation is rather jokey. Opinions will vary as to whether this is a good idea or not – I liked it in the main, although American humour can be remarkably unfunny at times. The hardware used by the authors is an IBM PC system and certain minor features cannot be implemented on the C64 – which ones are clearly pointed out in the accompanying literature, together with suggestions as to how to get around their absence.

"It makes sense to make back-ups"

The disk has an Editor/Compiler package on one side and a C Language function library on the other. Only the compiler itself is protected from copying so it makes sense to make and use backup copies for editing and linking.

Actually using the thing for the first time is made difficult by the woeful inadequacy of the loose-leaf "manual". This was obviously written by somebody who understood perfectly what he was doing and failed to appreciate that his readers might not. Since the book is clearly marked $19.95, it doesn't take a lot to work out that the disk and "manual" cost together over £100. For this sort of money it is reasonable to expect to be led by the hand a little bit. After all, it's easy enough to skip bits that are too easy but it's extremely difficult to invent bits that the author neglected to include. Needless to say, there is no index.

When once considers the amount of time, effort and money that must go into writing software – particularly something as involved as this – I find it incredible that so little thought is put into explaining how to use it. It doesn't cost a lot to hire a freelance writer and the difference to the end user – that's you – can be enormous.

"Cursor movement is faster"

To write a program in C

Power you first load and run the "shell" program from the system disk. This provides access to various other sections of the system, including a choice of two editors. One of these incorporates a syntax checker and is the obvious choice for the beginner. Using the editor is rather like using a word processor. The line number of the cursor position is indicated and there is a range of commands which can be accessed by pressing ›run/stop‹ in much the same way as you would use F1 in Easy Script or the logo key in Visa Write. The editor assumes an 80-column screen – presumably for compatibility with posher machines – but this is not a problem after a short while. Cursor movement is faster than the default value which we normally work with in BASIC and four-way scrolling is implemented. Anybody who has wanted to refer back more than 25 lines in a BASIC listing will appreciate this last feature more than a little. Even better is the "cut and paste" facility. Whole sections of your program can be moved about at will, enabling sub-routines to be written when you first need them and then shuffled to a different place as the rest of the program takes shape.

The standard notation of C includes curly brackets, a tilde, an underscore, a vertical bar and a backslash – characters which are difficult to find on the C64's keyboard. The six keys from + to £ and p to * are used for these but you have to remember which ones need ›shift‹ and which need ›logo‹ to operate them.

"1541 makes its presence known"

Once a program has been written, running it for the first time is a little laborious. First the compiler has to be called to convert the C file to "object code". Then the linker has to be used to link the object code to the necessary library routines and finally the program can be run. It is possible to specify an address at which the compiled code will commence – the default is the normal BASIC space. The 1541 makes its presence felt during these operations. If you're compiling a fairly long program it's an ideal time to make a cup of coffee, walk the dog or do a couple of crosswords. Provided that the program works, it only has to be done the once (for each type of machine you want the program to run on), so it's not such a great inconvenience.

C is a structured language. Not only must all variables be declared at the start of a routine but the type of variable must be declared. The types available are integers (subdivided into long, short, unsigned, floating point and double precision), characters and pointers. Programmers used to BASIC will benefit from the additional discipline that this imposes. If you've used other compiled languages, you'll already be used to this aspect. It's good programming practice and, if that's not a good enough reason, your C programs won't run unless you do it.

"You'll never use another language"

If you take the trouble to learn C, it's quite likely that you'll never use another language. If you want to be truly "computer literate", C will probably be as necessary to you as Shakespeare is to a student of the English language. I don't know how C Power stacks up against other implementations for other computers but it certainly seems to work in it's own right.

Apart from my previously stated reservations about the price and my indignation about the manual, the only complaint I have about C Power is that they have chosen not to implement long integers (long and short are considered synonyms). It's not a serious drawback but it is sometimes handy to be able to cope with numbers and it shouldn't be any more difficult to organise 32-bit arithmetic than it is to organise 16-bit.

If you've got a hundred and twenty quid burning a hole in your pocket, rush out and buy it.

Contact Pro-Line Software Ltd., 755 The Queensway East, Unit 8, Mississuaga, Ontario, Canada.

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NEW

Old Connections

PET owners curious as to whether PET peripherals and programs will work on later models will welcome this information from Alfred Rose

The introduction of the Commodore 128 will encourage many existing users of Commodore personal computers to change to the new model. It could also mean that a number of secondhand 64s will appear on the market.

Owners of PETS will be considering whether they can use their printer and disk unit on the 64 and 128, also which of their programs will work on the later models.

Enquiries at the average Computer store are met with a look of horror from the salesman at the very mention of a PET. Very few of the stores stock interfaces other than for printers and those that do have little if any knowledge of how to connect them or their limitations. It is hoped that this article will provide the information you require to climb the Commodore ladder of improved computing.

In choosing the three different interfaces to be discussed, I have only chosen those that can be used without having to disconnect units when switching from one model to another and they all work for both the disk unit and printer. Some units are not being reviewed because I consider the price too high, some costing more than the current price of the 64.

The term PET is used to cover the CBM 2000, 3000 and 4000 series. Most of the programs from these models, except for the more sophisticated, will work on the 64 and therefore on the 128. On Commodore 128, to make it work as a 64 you just type "GO 64", it then asks "Are you sure?", if you answer yes it resets as a 100% Commodore 64. Like the 64 it does not have an IEEE interface so you still require the units being described in order to use the PET peripherals.

Each of the methods for interfacing to be described have advantages and disadvantages over each other. You have to decide which is best for your particular applications.

SIPOD (MICROPORT)

The most economical interface is SIPOD, This uses the PET as part of the system. It is a serial to parallel IEEE software interface. No memory space is consumed within the 64 as SIPOD loads and resides in the PET.

The unit only costs £33.55 including VAT and is supplied complete with interface lead, program and instructions. One end of the lead is inserted into the parallel user port of the PET and the other end into the serial port of the 64 or 128. Once connected, the PET and its peripherals are switched on and SIPOD loaded and run. The PET screen displays the message "This machine is running the 'SIPOD' VIC20 & CBM64 serial to parallel IEEE software interface by MICROPORT".

As the program is very short, both load and run is almost instantaneous. For convenience, it is best to include a copy of the SIPOD program on each 64 disk. I found that most of the PET and all the 64 programs, including Superscript 64 and Calc Result, worked perfectly.

Once the program has been loaded into the 64 (which should be the last unit to be switched on), both the 64 and the PET can be used independently side by side. The only restriction which applies to all three systems is that no attempt is made to address the disk unit or printer if either is already in use. Of course the SIPOD message must be on the PET screen if the peripherals are being addressed by the 64. Another advantage of SIPOD is that it leaves the cartridge socket free on the 64 or 128.

The only disadvantage I discovered is that the speed of the disk unit is reduced and of course you are still committed to retaining your PET. An example of the slower speed of the disk unit it that a program of 73 bytes took 35 seconds to load with SIPOD but only 12 seconds using the other two methods to be described. Loading "Calc Result" took 62% longer to load on SIPOD. Though this is a disadvantage, it should be borne in mind that the 64 disk drive 1541 is slower than the PET dual disk drive — the faster 1571 single disk drive will be available later this year.

SIPOD takes only a few minutes to install, unless you are already using the Parallel user port of the PET — for example with the Jaytee software controlled memory pager. It may be necessary to convert the Jaytee unit to manual switching in order to leave the Parallel user port free.

Microport, 7 Clydesdale Close, Borehamwood, Herts. Tel: 01-935 8385.

JCL IEEE 488 BUS ADAPTOR CARTRIDGE.

This is a compact interface about the size of a standard cartridge. It is simply inserted into the cartridge port, the PET/IEEE connector is removed from the PET and inserted into the JCL cartridge. If it is required to leave both the PET and the 64 connected, it will be necessary to obtain an extra PET/IEEE cable from your Commodore dealer, the original lead was only one metre long making it difficult to connect to the 64, now Commodore are only supplying two metre leads.

Besides being an interface this small unit offers a number of extra features. They are described as follows:

1. Simultaneous access to both serial and IEEE-488 buses.
2. Multi user access to floppy disk for SAVE, LOAD and VERIFY.
3. Batch file system.
4. Programmable soft key with program SAVE/LOAD.
5. Mini DOS support built in.
6. Auto-Boot of specially named program file.
7. Screen dump to printer.

In the nine-page instruction booklet there is a warning that during power up, software is transferred from the cartridge to the $000 to $CFFF area. This means that it may clash with some popular packages which use the area $C000 to $C7FFF. The booklet says that this can be overcome by simply pressing the SHIFT/LOCK key prior to switching on, causing the cartridge to only transfer the essential IEEE routines to the area above $C7FFF. After power up the SHIFT/LOCK is released. On test, I found that the Easyscript, Superbase and the new Superscript 64 worked perfectly, providing you entered Poke 53241,0 before loading.

If the SHIFT/LOCK key is not pressed on powerup, there is an automatic loading facility of a preselect program. It is possible to overide this feature.

The adaptor is very intelligent in allocating device numbers, full details are given in the Reference Section of the manual.

The Mini-Dos Support is as the name suggests a simple DOS program, providing about six disk commands, but unfortunately not providing DLOAD and DSAVE. The most useful is the Directory command which allows the disk directories to be displayed without losing your program. It allows pattern matching and the display is excellent, as it is paged and therefore does not fly off the screen, as when using the inferior Directory command of Simon Basic.

A very simple "Screen Dump" is included, to dump the screen contents to a CBM printer, just press CTRL and P together. Graphic characters are not printed and all output is in upper-case.

The final features are SOFT-KEY and BATCH FILES. The left arrow is redesignated as a Soft-Key. Full instructions are given for teaching the Soft-Key a sequence of key strokes and saving the routine on disk for later use.

In conclusion, the JCL adaptor is a very neat way of interfacing and adding extra commands to the 64, providing you do not wish to use cartridge loaded programs together with the peripherals. Of course it may be possible to obtain a twin socket expansion for the cartridge port, but consideration would have to be given to the current consumed by anything inserted into the cartridge port, as the maximum current that can be drawn from pin 3 is 450 m/a. The price of the unit from JCL Software is £67.85 including VAT.

JCL, 1 Sheffield Road, Southborough, Tunbridge Wells, Kent TN4 0PD Tel: 0892 27454.

SUPER BOX64 (HANDIC SOFTWARE)

This unit is so simple to install and use that it only requires two pages of instructions. It does entail making one connection inside the 64, but this is simply done by using a rubber insulated crocodile clip to connect onto one end of R44. An illustration is included to help locate the resistor, but the later models of 64 have a completely different layout.

Do not let this deter you as R44 is clearly marked on the board and you connect to the unstrapped side. I have been unable to discover where the connection is to be made on the 128 but it should be on the HIRAM lead from the 6510A MPU.

I have to give the usual warning that by opening the case of the 64 you may effect the guarantee. The purpose of this connection is to make the IEEE-function work without using any of the RAM memory.

In addition to providing a totally transparent IEEE 488 interface, SUPERBOX 64 has provision for connecting up to three cartridges. Each is selected by means of individual switches at the rear of the unit. This saves wear of the cartridge contacts and allows for quicker change over, from one program to another. There is also a reset button to cold start the computer, without losing the contents of the RAM.

The IEEE interface also enables Multiuser facilities for up to four CBM 64s all using the same periphals. The only restriction is that no more than two peripherals may be connected at the same time.

Of course instead of using four 64s you can use your PET at the same time as the 64 as outlined above for the JCL unit.

By adding SUPERBOX 64 together with cartridges for your own particular applications, you will have a very powerful system which can be connected to the IEEE input of many scientific measuring and testing instruments.

I found SUPERBOX 64 very simple to use and reliable in loading even the most sophisticated programs such as Calc Result and Superscript, using standard 64 procedure.

SUPERBOX is available from HANDIC Software at £67.87 including VAT, and in my opinion offers the best value in interfaces for the 64.

Except for the cost, there is very little to deter you from upgrading your system, except that perhaps you may miss the Basic 4 and toolkit commands. But with SUPERBOX 64 there are spare cartridge slots in which can be inserted Programmers Friend.

This is a cartridge available from Whitby Computers (7 Chubb Hill Road, Whitby, North Yorkshire YO21 1JU), it allows the use of:— Append, Auto, Backup, Catalog, Collect, Concat, Copy, Dload, Dsave, Find, Header, Scratch and many other useful commands. The Find command is very efficient, displaying the entire line, not just the line number as in Simons Basic. The Catalog (Directory) can be made to pause by pressing the space bar.

As we are always discovering with computers, most things have some snags and Programmers Friend is no expection. Some programs will not load because they require a secondary address or use the area of memory occupied by PF, which uses 8192 bytes.

Whitby Computers offer custom made cartridges enabling a number of different commands to be chosen, providing the total number of bytes does not exceed 7100. The custom unit sells at £34.95 and the Programmers Friend at £29.95 inclusive.

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VISA

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Commodore 1520 printer/plotter £70 or may part exchange. Write to B Melling, 183 Gordon Street, Leigh, Manchester WN7 1RU or Tel: Bill on (Leigh) 670397 anytime.

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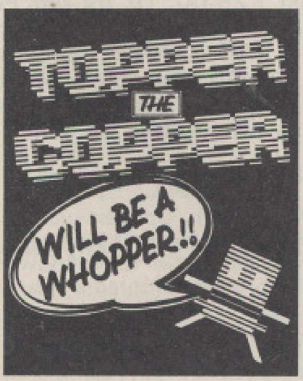

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